The Chemical Age

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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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A Great Patent Action

NOT since the prolonged hearing of Dr. Levinstein's claim for compensation in relation to the production of mustard gas (dichlorethylsulphide) has such a gathering of organic chemists—mainly from the North of England—been seen in the London Law Courts as was witnessed on Thursday, when the hearing was begun of an important action between Imperial Chemical Industries and the I.G., relating to certain dyestuff patents. The first intimation of the likelihood of such an action coming into court was published exclusively in our *Dyestuffs Monthly Supplement* as far back as June 8 (p. 41), and it excited considerable interest at the time. According to the petition, I.C.I. ask for the revocation of letters patent for certain dyestuffs. The I.G. have put in a motion for an amendment of the specifications of the patents.

Obviously the issues are of a highly technical nature, and much expert evidence may be expected during the hearing, in addition to the arguments of counsel. Mr. Justice Maugham is trying the action, and it is interesting to note, after his recent intimation on the point to both parties, that Professor Arthur Smithells, president of the Institute of Chemistry, is sitting with him as chemical assessor. Among dyestuff users and manufacturers, the action will be followed and the decision awaited with considerable interest. The first day's hearing is reported on another page.

The Future of the Nitrogen Industry

THE annual report of the British Sulphate of Ammonia Federation, a summary of which is published in this issue, records another general advance in the nitrogen industry for the year ended June 30 last. The chief feature to which attention is drawn is the continued tendency of production to outrun consumption. During 1928-29 there was an increase in nitrogen production of 389,000 tons, or 22½ per cent., Chile nitrate contributing 100,000 tons to this increase and other forms of nitrogen 287,000 tons. The increase in consumption amounted to £230,000, or 14 per cent. (as compared with an increase of 330,000 tons, or 25 per cent., in the previous year). Of this increase Chile nitrate accounted for 12 per cent., and sulphate of ammonia and other forms of nitrogen for 88 per cent.

It is obvious from an examination of the figures that the increase in production is almost wholly in synthetic forms of nitrogen. For example, while by-product sulphate of ammonia increased last year 8,000 tons, there was an increase on the synthetic product of 118,000 tons, and an increase in other forms of fixed nitrogen of 129,000 tons. If the present proportions of increased production and increased consumption continues—that is, 22½ per cent. to 14 per cent.—it is obvious, as the report indicates, what the end must be. No sign, moreover, is yet in sight of consumption catching up with production. In the coming year (1929-30), for example, it is estimated that the increase in nitrogen production will be anything from 250,000 to 400,000 tons, and a further increase in consumption of 22 per cent. will be required to absorb even the lesser total, with the stocks carried forward. It cannot be questioned that, viewing the agricultural needs of the world, there remains immense scope for the increased use of nitrogenous fertilisers. But this new territory, before it can become operative for consumption purposes, needs to be explored, educated, and organised into a market, and all this cannot be done without liberal and sustained expenditure on propaganda and sales. Yet, in the face of these facts, there is no slackening in the confidence of the heads of the synthetic nitrogen fertiliser industry in this country in the great future before it.

As regards price, with production increasing on the present scale, a downward tendency seems inevitable. This, in the long run, may be no disadvantage. From the public point of view of food supplies, cheap fertiliser is obviously a great gain, and here, as in so many cases, lower prices may be fully compensated by increased turnover and proportionately lower production costs.

The synthetic branch of the industry is in this respect probably better placed than the by-product side. The latter has been fully alive for some time to the price problem, and several sound authorities have been urging the need of more centralised, in order to secure more economical, production. The figures are set out in detail elsewhere (pp. 465-467), but one or two examples may indicate the general tendency. The general average price of neutral sulphate of ammonia for the year 1928-29 is returned at £8 9s. 3d. Ten years before (1918-19) the price stood at £19 6s. 6d. The contrast between these figures is pretty conclusive. During the year ending June 30 last, the selling price of synthetic forms of nitrogen suffered only a slight decline, but the decrease in the price of Chile nitrate is estimated at about 10 per cent. Moreover, for the coming year (1929-30) it is estimated that the average selling price of all forms of nitrogen will be down by another 10 per cent. In the face of these facts and estimates, the complete confidence expressed by responsible experts and directors in the future of the synthetic industry is impressive.

Creating the Worker-Capitalist

To firms like Benn Brothers, Ltd., which led the way in instituting a five-day working week, encouraging members of the staff to become shareholders in the company on specially favourable terms, and extending even to non-shareholding members the benefits of a cash bonus on the results of the year's business, it is a satisfaction to record any progress made along these lines. In the case of THE CHEMICAL AGE, it is particularly interesting to note the recent developments in these directions in Imperial Chemical Industries. Lord Melchett's presidency this week over the first meeting of the Central Council of the company is an event of interest to all chemical firms. This council consists of 39 representatives of the management and 39 representatives of the workpeople, and it will be in a position to speak for some fifty thousand employees distributed among nearly one hundred works in various parts of the country. The establishment of a Central Council is a natural development of the I.C.I. co-operative policy which produced the scheme for the formation of works councils inaugurated last April. There are now, we understand, over 70 of these works councils within the company.

The share investment scheme for I.C.I. employees, which was launched in January, 1928, enables employees to buy ordinary shares at 2s. 6d. less than the average market price quoted during the week previous to their application. Bonus shares are given to purchasers, the number of shares given depending on the number bought and the wages of the applicant. So great has been the success of the original scheme that it is now intended to allow employees of the company to purchase preference shares at the fixed price of 21s. 6d., yielding at this figure over 6½ per cent.

For the purpose of representation on the Central Council the companies in the great chemical combine have been divided into thirteen groups, comprising alkali, nitrogen, metal, dyestuffs, explosives, acids, electrolytic, limestone, blackpowder, leather cloth, salt, paint and lacquers, and miscellaneous products. Each group will have its representatives on the Central Council.

Faraday's Diaries

OF the diaries of Michael Faraday, which are expected to be published in about eighteen months' time, Sir William Bragg gave some interesting preliminary glimpses in a lecture the other day at the University of Manchester. "I do not believe," Sir William stated confidently, "speaking of them collectively, that there is in the scientific world a diary quite like it in its fullness and completeness." Most of the work Faraday did has, of course, been described in his *Experimental Researches*, but the attraction of this, as of most other diaries, is that it reveals something of the man himself, the workings of his mind, his directive ideas, and his attitude towards the great problems of physical science he set out to investigate. The notes cover about six volumes of foolscap, each of several hundred pages, all written in Faraday's very neat, small hand. They are to Sir William Bragg so human and interesting because "all the time you see what he is trying to do." One innocent remark recorded when Faraday was nearing sixty years of age, and when he had spent a lifetime in the most fruitful observation and experiment, might well be the first rule of every laboratory—"I must learn to observe."

Books Received

SOLUTIONS OF ELECTROLYTES. By Louis P. Hammett. London: McGraw-Hill Publishing Co., Ltd. Pp. 211. 11s. 3d.

THE PARACHOR AND VALENCY. By Samuel Sugden. London: George Routledge and Sons, Ltd. Pp. 224. 12s. 6d.

The Calendar

Nov.		
26	British Science Guild: Alexander Pedler Lecture, "Past Climates." Dr. G. C. Simpson. 5.30 p.m.	36, George Street, Manchester.
26	Institute of Metals (Birmingham Section): "The Modern Development of the Steam Locomotive." G. W. Woolliscroft. 7 p.m.	Chamber of Commerce, New Street, Birmingham.
27	Society of Chemical Industry (Newcastle Section): "Modern Boiler Practice" (Part II—"Boiler Feed Water Conditioning"). W. S. Coates. 7.30 p.m.	Armstrong College, Newcastle.
27	Royal Society of Arts: Dr. Mann Lecture. "The Examination of Coal and Coke by X-Rays." C. Norman Kemp. 8 p.m.	John Street, Adelphi, London.
27	Institution of Chemical Engineers: "Production and Treatment of Cellulose in the Paper Industry." James Strachan. 8 p.m.	Burlington House, Piccadilly, London.
27	Institute of Physics: "Physics in Relation to the Utilisation of Fuel." Dr. C. H. Lander. 5.30 p.m.	Institution of Electrical Engineers, Savoy Place, London.
27	Society of Dyers and Colourists (Midlands Section): "A Short Résumé of the Manufacture of Hosiery Goods with Special Reference to Difficulties met with in Dyeing and Finishing." F. Willis, W. A. Edwards. 7.45 p.m.	Globe Hotel, Silver Street, Leicester.
29	Institute of Chemistry (Belfast Section): "The Professional Aspects of a Career in Chemistry." R. L. Collett. 5 p.m.	Queen's University, Belfast.
29	National Smoke Abatement Society: "The Abatement of Domestic Smoke." Marion Fitzgerald.	College of Technology, Manchester.
29	Leicester Literary and Philosophical Society: "Science in Antiquity." Dr. J. Newton Friend. 7.30.	College of Technology, Leicester.
30	British Association of Chemists: Annual General Meeting and Dinner.	Manchester.
30	Institute of Metals (Birmingham Section): Annual Dinner.	Birmingham.

World's Nitrogen Industry: Past Year's Developments

"Tendency for Production to Outrun Consumption"

The annual report of the British Sulphate of Ammonia Federation for the year ended June 30 last constitutes a detailed and comprehensive review of the world's nitrogen industry. An important feature disclosed by the statistics is the contrast between a 22½ per cent. increase in production and a 14 per cent. increase in consumption. During the past year, there was only a slight decline in the selling prices of synthetic forms of nitrogen, but Chilean nitrate prices fell about 10 per cent.

World's Production and Consumption of Fixed Nitrogen

DURING the year under review, there was an increase of 389,000 tons or about 22½ per cent. in the production of the forms of nitrogen enumerated below, Chile nitrate contributing 100,000 tons and the other forms 287,000 tons to this total. The total consumption increased by 230,000 tons or 14 per cent., following on an increase of 330,000 tons or 25 per cent. in the previous season.

The figures in the table at the foot of the page are offered as fair estimates of the output of the various forms, but strict accuracy is not claimed for them; in the light of more recent information the figures for previous years have been slightly increased.

In view of the unsatisfactory economic position of farmers in many lands, the increase of 230,000 tons of nitrogen in the world's consumption during the year under review must be regarded as satisfactory. Chilean nitrate secured about 12 per cent. of this increase and the remaining 88 per cent. fell to sulphate of ammonia and other forms of nitrogen. The most notable increases in consumption took place in the U.S.A., Northern Europe, and the Japanese Empire.

Selling prices during the year for synthetic forms of nitrogen were only slightly below the level for 1927/28, but there was a reduction of about 10 per cent. for Chilean nitrate. For 1929/30 prices for all forms of nitrogen have been reduced by about 10 per cent.

The significant feature observable in the nitrogen statistics for the year 1928/29 is the tendency for production to outrun consumption. For 1929/30 a further considerable increase in production is expected; the estimates vary from 250,000 to 400,000 tons of nitrogen. An increase of about 22 per cent. in consumption is required to absorb the lower of these last two figures, together with the stock carried forward from 1928/29. Concerted efforts will be required on the part of the many groups producing nitrogen if consumption is to be maintained at this high level.

Home Production and Distribution

The figures for total production are taken from the Alkali Inspector's report, and relate to the calendar year, while the remaining figures relate to the "Fertiliser" year commencing July 1 in each year, hence the quantity stated below as exported for "1928" was exported during the year July, 1928 to June, 1929. The figures represent English tons of sulphate of ammonia. (See table at top of next column).

	Total production of Ammonia as Sulphate of Ammonia	Production of Sulphate of Ammonia as such.	Exported (Customs Returns, excluding Channel Islands and I.F.S.)	Used for Home Agricultural Consumption.	Nitrate of Soda used for Home Agr. Use
1913 ..	432,600	*372,000	323,440	*40,000	*80,000
1914 ..	426,400	*363,000	305,560	*50,000	*80,000
1915 ..	426,300	*350,000	264,610	*64,000	*40,000
1916 ..	433,700	315,500	188,270	144,600	*5,000
1917 ..	458,600	283,500	31,740	234,000	*5,000
1918 ..	432,600	331,500	37,630	269,000	*10,000
1919 ..	397,500	361,360	116,130	233,500	*40,000
1920 ..	**409,875	315,630	134,380	166,920	*40,000
1921 ..	**260,850	229,390	116,380	136,000	*55,000
1922 ..	**361,675	340,000	186,050	140,200	*57,000
1923 ..	**441,632	401,400	258,280	142,400	*50,000
1924 ..	**467,072	415,000	261,130	153,200	*40,000
1925 ..	**442,402	394,850	223,210	168,650	*35,000
1926 ..	**331,348	322,270	137,320	169,340	*33,000
1927 ..	**487,648	471,230	302,604	167,720	*37,000
1928 ..	**630,577	627,000	428,437	186,710	*49,500

* Estimated. ** Basis 25 per cent. Ammonia.

N.B.—The total consumption of Chilean nitrate is estimated at 73,000 tons as against 70,500 tons for last season. During the year there was a decline in consumption for industrial purposes, but an increase for agricultural use.

Home Agricultural Consumption

Home sales of sulphate of ammonia showed a very satisfactory increase of nearly 19,000 tons. This is undoubtedly due to the cumulative effect of the advisory work of recent years. The total annual consumption of pure nitrogen in the United Kingdom for all purposes is now about 72,500 tons, of which about 23,000 tons is used in industry. The detailed figures for sulphate of ammonia are as follows:—

(Tons of 2,240 lb.)

	Scotland.	Ireland.	England, Wales and Channel Islands.	Total.
1919–20 ..	71,900	42,000	119,600	233,500
1920–21 ..	50,900	26,000	90,020	166,920
1921–22 ..	33,600	19,400	83,000	136,000
1922–23 ..	42,100	20,000	78,100	140,200
1923–24 ..	41,000	21,800	79,600	142,400
1924–25 ..	42,800	22,600	87,800	153,200
1925–26 ..	44,930	26,140	97,580	168,650
1926–27 ..	43,670	28,280	97,390	169,340
1927–28 ..	41,880	26,700	99,140	167,720
1928–29 ..	47,072	30,902	108,736	186,710

WORLD PRODUCTION AND CONSUMPTION OF NITROGEN IN METRIC TONS OF PURE NITROGEN FOR THE FERTILISER YEAR.

Production :—	1923/24	1924/25	1925/26	1926/27	1927/28	1928/29
By-product sulphate of ammonia	264,600	278,300	296,700	328,200	368,000	376,000
Synthetic sulphate of ammonia	231,100	255,000	289,200	300,000	367,000	485,000
	495,700	533,300	585,900	628,200	735,000	861,000
Cyanamide*	104,000	115,000	150,000	180,000	204,000	210,000
Nitrate of lime	18,000	25,000	30,000	81,000	105,000	136,000
Other forms of synthetic nitrogen**	51,100	66,100	120,700	133,400	236,000	305,000
Other forms of by-product nitrogen**	50,200	47,400	47,700	42,300	54,000	51,000
Chilean nitrate of soda	338,500	367,500	399,400	199,600	390,000	490,000
Total production	1,057,500	1,154,300	1,333,700	1,264,500	1,724,000	2,113,000
Consumption :—						
Consumption of manufactured nitrogen	719,000	786,800	934,300	1,037,500	1,250,700	1,453,000
Consumption of Chilean Nitrate of soda	340,000	363,000	324,200	275,200	391,300	419,000
Total consumption	1,059,000	1,149,800	1,258,500	1,312,700	1,642,000	1,872,000
Agricultural consumption about	934,000	1,020,000	1,117,000	1,200,000	1,490,000	1,684,000

* Excluding the bulk of the cyanamide made in Japan, which is included under synthetic sulphate of ammonia.
** Including ammonia liquor used for industrial purposes.

Exports

Exports show an increase of 125,800 tons, or about 41 per cent. on last year's figures. The following figures show the shipments to the principal markets —

	1927/28	1928/29
Spain, Portugal, Canaries	85,050	104,396
Japan	100,915	146,087
China	49,800	93,332
West Indies and Mauritius ...	14,958	17,919
India and Ceylon	11,291	30,808
Australia and New Zealand ...	90	5,220

Geographical Distribution of Nitrogen Consumed

British and American exports of sulphate of ammonia for the last nine calendar years were :—

	United Kingdom. (Tons of 2,240 lb.)	United States.	Total. Tons.
1920....	110,016	89,566	199,582
1921....	128,433	102,614	231,047
1922....	145,255	147,331	292,586
1923....	247,536	150,595	398,131
1924....	263,012	115,047	378,059
1925....	248,752	122,498	371,250
1926....	150,167	174,159	324,326
1927....	251,640	140,679	392,319
1928....	377,635	93,016	470,651

The figures in the following table are to be taken as estimates only.

Consumption in Metric Tons of Pure Nitrogen.

Countries.	Ammonium Sulphate equivalent.	Chilean Sodium Nitrate.	Calcium Cyanamide.	Other forms of Synthetic Nitrogen.	Total.
	Fertiliser Year 1928/29.				
1.—Scandinavia, Russia, Baltic States, Germany, United Kingdom, Holland, Belgium, France, Switzerland, Austria, Czechoslovakia, Hungary, Roumania, Jugoslavia and Bulgaria	403,330	167,780	160,240	288,890	1,020,240
2.—Spain, Portugal, Azores, Madeira, Italy and Sicily, Egypt and other Mediterranean countries	77,770	61,430	13,460	22,520	175,180
3.—Indian Empire, Ceylon, Philippines, Straits, Dutch East Indies, Siam, Borneo, Japan, Korea and China	195,980	16,860	19,380	12,680	244,900
4.—Africa (excluding Egypt) and neighbouring islands	3,000	3,830	—	710	7,540
5.—United States, Canada, Central and South America, West Indian Islands, Cuba, Puerto Rico and Hawaii	132,000	167,920	24,400	92,870	417,190
6.—Australasia	4,730	1,630	—	670	7,030
Total	816,810	419,450	217,480	418,340	1,872,008
	Comparative Figures for Fertiliser Year 1927–28.				
1	386,198	145,300	149,614	228,870	909,982
2	72,577	58,645	14,366	15,320	160,908
3	166,234	13,035	19,708	2,070	201,047
4	2,547	5,590	—	128	8,265
5	113,953	168,347	18,680	55,450	356,430
6	3,790	1,805	—	100	5,695
Total	745,299	392,722	202,368	301,938	1,642,327

The consumption of " Ammophos " is included under calcium cyanamide. The bulk of calcium cyanamide made in Japan is converted into ammonium sulphate and is included under the latter.

Propaganda Work

The Research and Advisory Department of Nitram, Ltd. has continued and extended the programme of research and propaganda work at home and overseas. The Research and Experimental Station at Jealott's Hill, Bracknell, Berks, was formally opened on June 28 by the Rt. Hon. J. H. Thomas, M.P., Lord Privy Seal, in the presence of a distinguished company of guests, including many agriculturists. Research work has been in progress for some time, and a large number of field experiments with arable and horticultural crops, and with grass, have been started at Jealott's Hill, together with the related laboratory work. More than 1,200 plots were used in connection with field experiments at Jealott's Hill in 1929, and special investigations and experiments were carried out at 264 centres in the British Isles. Special study was given to the following subjects :—The relative effectiveness of fertilisers ; the manurial requirements of arable crops and grassland ; grass preservation ; improvement of the physical condition of soils ; the economics of manuring. A special staff has been formed to supervise the experimental work in the country, and a period of training in this work will be an essential qualification for advisory work.

The propaganda staff in the British Isles consists of twenty-two advisers, who are engaged full time on propaganda work, and the co-operation between this staff and the Area Sales Offices of Imperial Chemical Industries in England and Wales, and Scottish Agricultural Industries in Scotland, has proved very successful. The advisory districts have been sub-divided into zones which are worked in rotation, thus ensuring that all parts of the country are covered evenly and regularly.

The use of nitrogen on grassland has become a vital factor in British agriculture, and it is calculated that in 1929 some 80,000 acres of pasture land in the British Isles received dressings of nitrogenous fertilisers. Farmers have been quick to realise the value of an " early bite " and a " late bite " of grass.

More than 11,000 farmers attended the Nitram lectures and film displays during the winter, and touring propaganda vans were introduced successfully in England and Ireland. Literature has been simplified and brought up to date, and the demand was very heavy during the spring months. Two editions of *Farm Notes* were published, and the result of a questionnaire showed that farmers appreciate this paper. A satisfactory feature has been the number of postal inquiries for advice received at head office and by the advisers.

Propaganda overseas has been continued in India, China, Java, Sumatra, Japan, Malay States, Palestine, the Sudan, Kenya, South Africa, Spain, Portugal, Italy, the West Indies, Argentine, Canada, Australia and New Zealand. The propaganda organisations in China, Japan, India, Australia and New Zealand have been strengthened, and sales continue to reflect progress. Members of the Research and Advisory staff visited the United States, Canada, Australia and New Zealand, and grassland and other investigations have been started in all these countries and in East Africa.

The contribution of members of the Federation to Nitram's propaganda expenses at 2s. per ton produced amounted to £67,180. This sum represents about one-third of Nitram's total expenditure on research and propaganda. Mr. A. Stanley and Mr. R. Halkett were the Federation's representatives on the Joint Propaganda Committee of Nitram.

General Average Prices

The following are the average prices per ton for all deliveries, home and export, free on rails at makers' works in single bags free :—

	For 24¾ per cent. Ammonia. £ s. d.	For 25½ per cent. Ammonia, Neutral. £ s. d.
1917–18	16 7 3	—
1918–19	18 6 9	19 6 6
1919–20	22 13 3	23 15 3
1920–21	21 8 8	23 0 2
1921–22	12 13 3	13 19 3
1922–23	14 0 0	15 6 0
1923–24	11 19 11	13 5 11
	For 20·4 per cent. Nitrogen.	For 21·1 per cent. Nitrogen.
1924–25	10 18 0	12 5 6
1925–26	9 11 3	10 18 9
1926–27	8 8 7	9 16 1
1927–28	7 14 2	9 1 8
1928–29	7 1 9	8 9 3

Home Prices

The following are the prices charged to British farmers per ton delivered to buyer's nearest station, in recent years.

Sulphate of Ammonia :—	1922–23. Neutral basis 25¾% Ammonia. £ s. d.	1923–24. Neutral basis 25¾% Ammonia. £ s. d.	1924–25. Neutral basis 21·1% Nitrogen. £ s. d.	1925–26. Neutral basis 21·1% Nitrogen. £ s. d.	1926–27. Neutral 20·6% N Minimum. £ s. d.	1927–28. Neutral 20·6% N Minimum. £ s. d.	1928–29 Neutral 20·6 % N Minimum £ s. d.
July	16 3 0	14 5 0	14 0 0	12 5 0	13 1 0	12 6 0	10 13 0
August	16 3 0	14 5 0	14 0 0	12 5 0	13 1 0	9 18 0	10 0 0
September	16 8 0	14 10 0	14 2 0	12 7 0	11 7 0	10 0 0	10 0 0
October	16 8 0	14 12 6	14 4 0	12 9 0	11 9 0	10 2 0	10 2 0
November	16 13 0	14 15 0	14 6 0	12 11 0	11 16 0	10 5 0	10 5 0
December	16 13 0	14 16 0	14 8 0	12 13 0	11 18 0	10 8 0	10 8 0
January	16 18 0	15 2 0	14 10 0	12 15 0	12 0 0	10 11 0	10 11 0
February	16 18 0	15 3 0	14 12 0	12 18 0	12 3 0	10 13 0	10 13 0
March/May	17 3 0	15 5 0	14 14 0	13 1 0	12 6 0	10 13 0	10 13 0
June	17 3 0	15 5 0	12 5 0	13 1 0	12 6 0	10 13 0	10 13 0
Nitrate of Soda, 15½% Nitrogen : Spring price about :—	14 5 0	14 5 0	14 0 0	14 0 0	13 10 0	11 10 0	10 12 0

N.B.—The above prices for nitrate are calculated on the same delivered basis as the sulphate prices ; the net price at U.K. ports was about £1 per ton less.

Membership

The Federation numbered on July 1, 1929, 400 members (a decrease of 3 on 1927-28) whose annual production represents about 92 per cent. of the total annual output in Great Britain and Ireland on the basis of the production for the calendar year 1928. The decrease is due to alterations in constitution and amalgamations, not to withdrawals. The Federation continues to represent a very large proportion of the output in India and South Africa.

The Asbestos Fusion

Turner and Newall to Acquire Rhodesian Concern

An official statement issued in Manchester on November 17 indicates that meetings of the shareholders of Turner and Newall, Ltd., and the Rhodesian and General Asbestos Corporation, Ltd., are to be called to consider recommendations of their respective boards for the acquisition of the whole of the issued share capital of the Rhodesian and General Asbestos Corporation, Ltd., by Turner and Newall, Ltd. The terms proposed are five ordinary Turner and Newall shares for four Rhodesian and General Asbestos Corporation shares, and the Turner and Newall shares so to be allotted and issued in exchange will rank *pari passu* with the existing ordinary shares of Turner and Newall, Ltd., but without taking any dividend which may be declared by Turner and Newall, Ltd., in respect of their financial year ended September 30 last. The Rhodesian and General Asbestos Corporation, Ltd., will pay a dividend of 15 per cent., less income tax, for the six months ended September 30 last.

Turner and Newall recently acquired the business of Bell's United Asbestos, together with its subsidiaries, while the company's interests include the control of a number of other asbestos undertakings. The company was formed in 1920 as a private concern and became a public undertaking in 1925. The share capital has been increased from £3,000,000 to £5,297,929 during the last two years. Rhodesian and General Asbestos, which is a producing company owning claims in Southern Rhodesia, has an issued capital of £1,050,000.

Lord Melchett on Empire Trade

Work of the Producers' Organisation

A meeting of the Council and Vice-Presidents of the British Empire Producers' Organisation was held at Imperial Chemical House, Millbank, London, on Tuesday, November 12. Lord Melchett was welcomed as the new chairman of the organisation by Mr. V. A. Malcomson, the vice-chairman.

Lord Melchett proposed the following resolution :—" That, having in mind the desirability of the adoption of a policy of the development of the Empire as an economic unit, this Council recommends that immediate steps be taken to promote the conclusion of extended reciprocal trade agreements between the United Kingdom and the several parts of the Empire overseas."

In his support of the resolution, Lord Melchett stated that there was no greater need at the moment than a fusion of the British Empire, in order to promote interchange of commodities, goods, and services. The necessity of amalgamations in trade was as apparent in nations as in industries. It was a curious paradox that during the whole of the political agitation on fiscal matters large units had become more and more inter-related in trade, for example, Canada, Australia, and the most outstanding example of all, the United States. Among the best minds and the clearest thinkers in Europe there was more than a tendency towards the creation of the United Economic States of Europe. The development of this idea into a concrete fact might take time, but there could be no gainsaying the adherence that the idea had obtained. Britain was, therefore, faced with a clear issue. It was whether she was to combine in an economic entity with the rest of Europe or whether she was to develop the Empire as economically united. Britain, with its large population and small area, had become entirely unbalanced as between industry and agriculture. Owing to this unequal balance, the whole economic life of the country was threatened. Outside coal, Britain was not self-contained in any essential raw materials. The obvious means of re-adjusting this balance was to balance over-industrialised Britain with the over-agriculturalised other units of the Empire.

Sir Edward Davson, ex-President of the Federated Chambers of Commerce of the British Empire, seconded the resolution, which was carried unanimously.

The preliminary work for a report on the present position of Empire production and trade for submission to the Government, and later to the Imperial Conference, was discussed. Among other matters of importance dealt with were a long report, with statistical analyses, on Britain's food supply with special reference to the Empire, entitled " The Key to Empire Trade " ; the preparation, for weekly publication, of comparative prices (producer's, wholesale and retail) of the principal food commodities ; a proposed conference of British agricultural associations to endeavour to bring about a common policy between Overseas Empire and home agricultural producers, particularly of wheat, meat, and dairy products.

New Benn Books

The following are among the new books announced for early publication by Ernest Benn, Ltd. : *Ur of the Chaldees*, by C. Leonard Woolley (7s. 6d.) ; *British Policy and the Palestine Mandate : Our Proud Privilege*, by Herbert Sidebotham (1s.).

Imperial Chemical Industries-I.G. Patent Action

Hearing Commenced

On Thursday, in the Chancery Division, Mr. Justice Maugham, sitting with Professor A. Smithells, D.Sc., F.R.S., C.M.G., President of the Institute of Chemistry, as chemical assessor, commenced the hearing of a motion of the respondents, I.G. Farbenindustrie Aktiengesellschaft, in the matter of letters patent Nos. 193,834, 193,866, and 193,771, under the Patents and Designs Acts, 1907 to 1919, and a petition of Imperial Chemical Industries, Ltd., in the matter of the same patents.

Mr. Whitehead, K.C., and Mr. Trevor Watson appeared for the respondents, and the Hon. Stafford Cripps, K.C., and Mr. Lloyd Jacob for the petitioners. The Comptroller of Patents was represented by Mr. S. Crossman.

A Petition and a Motion

Mr. Whitehead stated that the petition was for the revocation of these letters patent. The petition was launched under section 25 of the Patents and Designs Acts, which provided, *inter alia*, that a petition for revocation might be launched by a party who had the fiat of the Attorney-General. His learned friend for the petitioners had received the fiat to launch this petition. There was also a motion by the respondents to the petition, the owners of the patents. The motion sought an amendment of each of three specifications of the patents in question. The motion was under section 22 of the Patents and Designs Act, which enabled the owners of the patents for time being to sue for leave of the Court to amend the specifications. The patentees on January 12 of this year moved before Mr. Justice Eve for leave to amend, and after due notice only the petitioners appeared before the Court.

Mr. Cripps: We do not think the amendment will materially alter the patents at all.

Mr. Crossman said he could not consent to the amendment without hearing the case.

Numerous Exhibits

Mr. Whitehead stated that there were 3,756 exhibits. The petitioners were directors and managers of the British Dyestuffs Corporation, Ltd., and the holders of 99 per cent. of the issued capital. The respondents were a German corporation of Frankfort-on-Main. The petitioners sought revocation of the patents on the grounds of prior publication, prior common general knowledge and insufficiency of description. The court would be concerned with matters of a highly technical nature. The subject matter of the patents related to dyestuffs, and a particular class of dyestuffs which went by the names of azo dyestuffs.

The Specifications

The petitioners pleaded that the letters patent Nos. 193,834 and 193,866 were granted to Farbwerke vormals Meister Lucius und Bruning, a German company, for inventions in the manufacture of azo dyestuffs. Letter Patent 193,771 was granted to Arthur John Bloxam, for an invention in the manufacture of azo dyestuffs, and purported to have been communicated to him from abroad by Chemische Fabrik Griesheim Elecktron, a German company of Frankfort-on-Main. The specifications now stood in the names of the respondents.

The complete specification of No. 193,834 purported to describe and claimed a process for the manufacture of azo dyestuffs which consisted in coupling a diazo compound with an ortho-alkyloxy-anilide of 2 : 3-oxynaphthoic acid. The specification further claimed the azo dyestuffs when produced by the process claimed or any process which is the obvious chemical equivalent of such process.

The complete specification of No. 193,866 purported to describe and claimed a process for the manufacture of azo dyestuffs, which consists in coupling a diazo compound with a halogenated para-toludide or para-alkyloxyanilide of 2 : 3-oxynaphthoic acid. The specification further claimed the dyestuffs when produced by the process claimed or any process which is the obvious chemical equivalent of such process.

The complete specification of No. 193,771 purported to describe and claimed a process for the manufacture of monazo-dyestuffs which consisted in coupling a diazo compound with an ortho-toluidide of 2 : 3-oxynaphthoic acid. The specification further claimed the dyestuffs when produced by the process claimed or any process which is the obvious chemical equivalent of such process.

By reason of the said letters patent the subject matter of the petition, the respondents were able to extend the above-mentioned monopoly in certain processes for the manufacture of azo-dyestuffs, particularly in the process of dyeing cotton with azo dyes developed on the fibre.

Petitioners said by reason of the existence of the said letters patent they were being greatly hampered in their business.

Counsel, in giving the Court a short history of dyestuff chemistry, stated that over 3 million dyes could be made from diazo compounds, owing to the discovery by various people of appropriate coupling properties, which produced different colours, shades, tints, and so on.

His speech had not concluded when the Court adjourned until Friday morning.

Anti-Corrosion Process

British World Monopoly

A British monopoly in the field of metal-coating is foreshadowed in the formation of the Metals Coating Co., Ltd., which has been organised to acquire the assets of Metallisation, Ltd., of Dudley, and Metallisation (Sales), Ltd., of London, firms which control the sales and contracting rights in the British Isles and India of a process for coating any metallic or non-metallic surface with any metal that can be drawn into wire or obtained in powder form.

The company, which has an authorised capital of £150,000, divided into 600,000 shares of 5s. each, holds a six months' option to acquire 91 per cent. of the issued ordinary share capital of the Metals Coating Co. of America, Inc., which controls Metallisator A.G. of Berlin and Metallisator A.G. of Hamburg, three companies which, together with the British firms now being acquired, between them control the world rights for the manufacture, sales and contracting licences of the metal-spraying pistol which is widely used in industry throughout the world. The directors of the company are Mr. F. B. Goodchild (chairman), Mr. E. Beck, Mr. W. J. Thompson, and Mr. H. J. Williams. Of the 600,000 shares of 5s. each, 500,000 shares are in issue. Of these 420,000 have been issued for cash at par and are fully paid, and 80,000 shares have been issued credited as fully paid in full satisfaction of the purchase consideration for the shares in Metallisation (Sales), Ltd. The balance of the capital will be offered in the first instance *pro rata* to the company's shareholders if and when it is decided to make an issue.

Varied Uses

The principal uses for the process are for coating metals against corrosion and erosion, but other uses include the application of conducting metals on glass and other insulating surfaces, the spraying of metals on wood, fabrics and leather for decorative purposes, and the coating of rubber sheets with zinc to form combined loud-speaker and cinematograph screens, which, it is claimed, will revolutionise the sound-film industry.

Continuous users of the process in Great Britain include Guest, Keen and Nettlefolds Ltd., Courtaulds Ltd., the Mond Nickel Co. Ltd., and the English Electric Co. Ltd., while among the more important licensees of the process abroad are Siemens-Schuckert A.G., Krupps, Thyssen and Co. of Germany, and the General Electric Co., Bethlehem Steel Co., Standard Oil Co., and Ford Motor Co. of America.

Polish Trade in Coal Tar Products

Poland's foreign trade in coal tar and derivatives during the first six months of 1929 showed an increase compared with the same period of 1928. A decrease in the quantity of imports, January-June, 1929, was more than compensated for by increase in exports, outbound shipments of these products totalling 146,665 quintals in the first half of the present year.

Acetonedicarboxylic Acid as a Leavening Agent

By Edwin O. Wiig

The following article, recently presented to the Division of Agricultural and Food Chemistry of the American Chemical Society, and published in "Industrial and Engineering Chemistry," seems to open up an interesting new possibility.

AUTHORITIES disagree as to the physiological action of the products left by baking powders in baked goods. Inasmuch as all common baking powders leave saline cathartics, such as sodium tartrate, Rochelle salt, disodium acid phosphate, or sodium sulphate, and since there is some question as to the physiological effect of aluminium hydroxide, a leavening agent that would leave no residue would preclude the possibility of any controversy and would constitute an ideal baking powder. Some time after the completion of a study of the kinetics of the decomposition of acetonedicarboxylic acid, it occurred to the author that this substance might serve as a leavening agent, since it readily decomposes into carbon dioxide.

Preparation and Testing

Acetonedicarboxylic acid was prepared by adding fuming sulphuric acid to citric acid. The resulting acetonedicarboxylic acid was crystallised from ethyl acetate several times and then dried over calcium chloride. Cornstarch or other starch was dried by heating under reduced pressure in a flask on a steam bath. Starch and acetonedicarboxylic acid were then weighed and mixed so as to give a baking powder which would yield from 13 to 15 per cent. of carbon dioxide, the usual strength of a commercial baking powder.

Cakes, and in one case bread, were then baked, using a commercial baking powder and some acetonedicarboxylic acid baking powder. The same recipes were used and the same oven conditions, the two products generally being baked side by side. In every case the acetonedicarboxylic acid powder raised the product as well as the commercial powder.

The Presence of Acetone

Experiments were carried out to determine whether or no acetone was left in the product. A cake leavened with acetonedicarboxylic acid baking powder was run through a food chopper, which was subsequently carefully washed with water and the washings added to the ground cake. A thin paste was made of the cake by adding a litre of water, and then steam-distilled until 200 to 300 cc. of distillate collected. A few drops of sulphuric acid were added to the distillate, which was then distilled until 30 cc. were collected. On adding 10 cc. of this distillate to 25 cc. of a saturated solution of 2 : 4-dinitrophenylhydrazine in 2*N*-hydrochloric acid, no precipitation was obtained, while 0·005 cc. of acetone in 10 cc. of water gave a heavy precipitate. Hence not more than a trace of acetone can possibly be present, since it is readily volatilised at baking temperatures. Furthermore, small amounts of acetone are known to be harmless.

All of the acetone, however, was not volatilised from the one sample of bread which was baked, for the characteristic odour of acetone was strongly evident.

Stability of the Baking Powder

Several preliminary experiments have been conducted to determine the stability of acetonedicarboxylic acid baking powder at various temperatures. According to the literature acetonedicarboxylic acid decomposes in a few hours at room temperatures. However, in the course of a study of the kinetics of the decomposition of acetonedicarboxylic acid, weighed quantities of the acid that were allowed to stand in a desiccator over phosphorus pentoxide from March to October showed no decomposition.

Several samples of acetonedicarboxylic acid baking powder were kept in stoppered glass bottles at various temperatures for some time. The available carbon dioxide was then determined by boiling a 1·5- to 2·0-gram sample with water and absorbing the gas in potash solution. The apparatus used was essentially the same as that used in determining the available carbon dioxide in a baking powder. The data obtained are given in Table I. The carbon dioxide at the beginning of the experiment was calculated from the percentage of acid mixed with the starch, except in samples 1 and 2, in which the carbon dioxide was actually determined.

Table I.

AVAILABLE CARBON DIOXIDE IN ACETONEDICARBOXYLIC ACID BAKING POWDERS.

Sample	Time	Temperature.		Available Carbon Dioxide.			
				At start.	At end.	Calcd. at end of year.	Calcd. to 15% available CO_2 powder.
	Days.	°C.	°F.	Per cent.	Per cent.	Per cent.	Per cent.
1	43	32·2	90	14·00	13·69	11·36	12·17
		23·9	75				
2	43	32·2	90	14·00	13·66	11·11	11·91
		23·9	75				
3	105	23·9	75	13·00	12·60	11·61	13·40
4	70	23·9	75	15·00	14·53	12·56	12·56
5	72	23·9	75	13·00	12·52	11·24	12·98
	72	0	32				
6	72	23·9	75	13·00	12·52	11·24	12·98
	72	0	32				

In a refrigerator the acid does not decompose at all or at least only very slowly. This was shown by blowing nitrogen through bottles of the baking powder that had remained in a refrigerator for more than two months, no carbon dioxide being obtained. The results have been calculated to a 15 per cent. available carbon dioxide powder as shown in the last column in Table I. The data indicate that mixtures made up to give 15 per cent. carbon dioxide would contain more than 12 per cent. (the legal minimum) after standing at room temperature for a year.

Samples 3 and 4 have been kept at room temperature for 17 and 14⅔ months, respectively. The percentage of available carbon dioxide was then determined by titrating the undecomposed acetonedicarboxylic acid with tenth-normal alkali. Sample 3, which originally contained 13 per cent. available carbon dioxide, was found to have 9·2 per cent. at the end of 17 months, while sample 4, which originally had 15 per cent. carbon dioxide, still contained 11·3 per cent. at the end of 14⅔ months. Calculations from both samples indicate that a powder containing 15 per cent. available carbon dioxide at the start would contain 12 per cent. at the end of 12 months.

Conclusion

Most baking powders are "double-acting"—that is, a part of the carbon dioxide is liberated on mixing the batter and the remainder on baking. Acetonedicarboxylic acid decomposes only slightly in the batter unless some of the ingredients are heated. This can be overcome by adding a small amount of sodium bicarbonate, sodium carbonate, ammonium carbonate, or other slightly alkaline salt which, in the kinetic study previously referred to, were found to catalyse the decomposition of acetonedicarboxylic acid. However, this would leave the catalyst in the baked product, which it is desired to avoid. Furthermore, the acetonedicarboxylic acid baking powder raises cake sufficiently without a catalyst.

An acetonedicarboxylic acid baking powder might be manufactured to compete with the more expensive baking powders on the market, especially if cheaper citric acid is made available. Such a powder would have the advantage of leaving nothing in the baked product.

U.S.A. Acetone Exports

ACETONE exports from the United States during the first nine months of the present year amounted to 6,159,663 lbs., valued at $563,781. Of the total, nearly two-thirds, or $363,700 worth, came to the United Kingdom, although no shipments were made in August or September. Other principal takers during the three-quarter period of 1929 were Canada, $51,200; Belgium, $50,200; Cuba, $33,400; Japan, $17,900; and Australia, $15,800.

Chemistry in the Printing Trade

By F. J. Tritton, B.Sc., A.I.C., F.R.P.S.

THE printing trade is one of those large industries that have grown very slowly, each new idea only being accepted with extreme caution and so coming very gradually into general use. But owing to the enormous demands for printed matter, progress has been continuous and real, so that the present-day industry is a monument of applied science, but at the same time there is hardly a full-time scientist actually employed in it. The bulk of the progress and new inventions have come from the cognate industries supplying the various raw materials and appliances required, for example, the paper manufacturers, ink manufacturers, photographic manufacturers, type founders, and, most important of all, the engineers and machine builders. In all this, chemists have naturally played their part, but only a small part, and much less than they should have done considering the complicated chemical aspects of many of the problems involved.

Complex Problems

Thus it is partly due to the fact that printers have been able to look to other industries to solve many of their problems, and partly to the old craft spirit, which has survived here more than in almost any other industry, that master printers have not yet realised the advantages to be obtained from a systematic chemical study of their processes. On the other hand, it has to be admitted that most of the problems are so complex that they do not seem open to a ready solution, so that any investigation must be prolonged and expensive before bringing a commercial return. Nevertheless, the value of a scientific study of printing processes is being more and more realised, although this country can hardly be said to be a pioneer in this respect.

Printing can be divided into two main classes, (1) typographic or letterpress printing, and (2) illustration printing. In letterpress printing, nearly all the chemical problems which arise are related to those of the allied industries supplying the raw materials, and so may justifiably be referred back to those industries and need not be considered here. But in the second group there are aspects which are essentially different from those met with in any other industry, and which would certainly well repay a very much greater attention than they have received up to the present.

Illustration Printing

Illustration printing may be sub-divided into (*a*) Lithography, in which the printing surface is produced by hand drawing on stone or metal, and (*b*) Photomechanical processes, in which the printing image is formed by various photographic means. Group (*b*) may be further sub-divided into (1) Relief processes, that is, the making of line and half-tone blocks used in conjunction with letterpress in typographic printing; (2) Planographic processes, such as photolithography, pantone and collotype; and (3) Intaglio processes, of which photogravure is the only important example.

Lithography itself, although one of the oldest illustration printing processes (invented by Lenefelder in 1796), still has a number of interesting problems not properly solved, connected with preventing the ink from taking on the slight tooth of the damped portions of the stone or metal, which should reject all ink. This rejection of a greasy ink by a wet surface is controlled entirely by the exact degree of wetting, and the careful preparation of the stone by a series of operations the history and *raison d'être* of which are difficult to explain. The application of modern methods, and the use of suitable wetting agents to control surface tension, should lead to the great simplification of such an operation. But, on the other hand, the present methods, although involved, are generally successful, and hence the necessity to examine the process more carefully has not arisen.

Photomechanical Processes

All the photomechanical processes are based on the use of a mixture of potassium dichromate and gelatin, glue or fish glue, which is used to produce photographic images or "resists" in a variety of ways, which resists in their turn control the etching or preparation of the metal which forms the actual printing surface. It is here that chemistry should be able to play a big part, and it is slowly making itself felt; but there is a very long way to go yet before it can be said that anyone really understands the relatively simple operations that are taking place in hundreds of printing works at every hour of the day.

It is necessary first to explain something of the behaviour of dichromated gelatin. Fox Talbot discovered in 1852 that gelatin, or any organic colloid of this type, such as glue, casein, gum arabic, etc., when mixed with potassium dichromate and exposed to light, becomes insoluble in hot water.

The chemistry of this apparently simple reaction has not yet been adequately explained, but it has been demonstrated on several occasions that the dichromate is reduced to chromium dioxide CrO_2 or chromium chromate $Cr_2O_3CrO_3$. There are two schools of thought as to why this reduction should cause tanning, and strong evidence can be cited in favour of both. During such a reduction oxygen must be liberated and must oxidise the gelatin; it is then assumed that this oxidation product is tanned gelatin, but no direct proof of this can be forthcoming until much more is known of the constitution of gelatin. The other view is that the free valencies of the chromium chromate combine with the gelatin, but again no definite proof of combination can be given, because the amount of chromium necessary to cause tanning seems to be variable and because all stages of tanning, from a very lightly tanned gelatin, which readily swells, to one which will hardly swell at all, can be obtained.

Analogy with Leather Tanning

Chemical evidence, however, favours this latter explanation, because the whole process is so closely allied to the chrome tanning of leather, although it has to be carried out under distinctly different conditions if it is to be a success from the photographic point of view.

A closely related fact is that a number of precipitates, if actually formed in the presence of gelatin, have the power of tanning it, although if added in any other way they have no effect. This, however, must be taken as a further proof that the free valencies of the gelatin and precipitate can combine under suitable conditions in just the same way as gelatin and chromium dioxide combine in chrome leather manufacture under a much wider range of conditions. Further knowledge of the mode of combination of gelatin and chromium dioxide should lead to greater ease in controlling the tanning process, and would probably lead to further methods of increasing the light sensitivity.

The Action of Light

All these dichromated gelatin processes are essentially contact printing processes which must be exposed to daylight, powerful arc lights or mercury vapour lamps. Naturally, the printing trade cannot rely on daylight, so that the cost of the necessary lighting installation is usually fairly heavy. Hence, if the sensitivity can be increased, there is bound to be a considerable saving in light and equipment as well as in time. The exposure given is frequently at least double the maximum that ought to be considered necessary, because ammonia is added to the dichromate sensitiser until it is yellow in colour. If added correctly, this reduces the dichromate to the double potassium ammonium chromate, which is the most light-sensitive of the various chromates. In the early days of the printing trade, when this custom arose, there was good justification for it, because nearly all commercial dichromates contained more or less free chromic or sulphuric acids, and chromic acid has a spontaneous tanning action on gelatin in the absence of light. But for many years now, any good quality dichromate has been entirely satisfactory, and is only spoilt by the various additions dictated by an obsolete tradition.

It has long been known that the light sensitivity of dichromates can be increased by the addition of reducing agents, which set up an incipient reduction which is easily completed by light action. This, however, is unsatisfactory, because the reaction between dichromates and gelatin or glue is a spontaneous one, although the rate of reaction is low in the dark, but in the presence of reducing agents the rate of deterioration is much higher, and consequently such a rapid falling off

in quality takes place that the process is impracticable commercially.

A New Process of Light Sensitisation

The writer has recently (*Photographic Journal*, **69** (1929) 281–285) described another method of increasing the light sensitivity to about three times the normal, the method being more reliable than the previous methods. It is based on the following considerations :—

It may be shown that when dichromated gelatin is exposed to light the first product of the action of the light is a chromate. This may either be produced at the same time as, or prior to, the formation of the chromium chromate, which causes the tanning effect. It seems most likely that there is a chain reaction, in which the first product is potassium chromate and the last chromium chromate, with an unknown number of steps in between. The chromate does not harden, and the full tanning effect is only obtained with the end product of the reaction. There are a number of metals whose salts do not form precipitates with dichromates, owing to the pH of the solution being too low, but which form insoluble chromates; hence, when added to the sensitive dichromate mixture they have no effect, but during exposure they are precipitated as insoluble chromates.

It is found that all these chromates have a tanning influence, which appears to vary from metal to metal, although the order of tanning power has not yet been determined. The most suitable metals for use in this way are copper, nickel, cobalt, cerium and most of the rare earth metals, but the chromates of all these are precipitated at different pH values, and to get the best results and freedom from fogging or veiling effects, it is necessary to select a metal whose chromate is precipitated at a pH a little above that of the mixture of gelatin, etc., to be sensitised. In many cases, if unnecessary ingredients are not added, this is at the pH value 8, so that cerium or lanthanum salts are the best to use, their chromates being precipitated at pH 8 and 8·5 respectively.

Spectral Sensitivity of Dichromated Mixtures

Another point of interest is the spectral sensitivity of these dichromated mixtures. Cartwright (*Photographic Journal*, **63** (1923), 265–275) has shown that the sensitivity extends from the ultraviolet into the blue-green. Despite the high sensitivity to ultraviolet, this is often an undesirable constituent of the light, because it is so rapidly absorbed by both gelatin and dichromate that it cannot penetrate to any depth, and so tends to form surface images. It is better to rely on the violet light, and hence aesculin screens to cut out ultraviolet light have been proved to give better gradation in photogravure.

On several occasions, it has been claimed that it is possible to sensitise dichromate to other wave lengths in the same way as silver bromide emulsions can be sensitised, but these ideas have not yet been substantiated, unless the latest claim can be justified. If this sensitisation be achieved, it would amount to greater speed, owing to the large amount of yellow in most artificial light soucres.

Printing from Metal Surfaces

Practically all modern printing is from metal surfaces, copper, zinc, and aluminium being the commonest, and the physical condition of these surfaces must play an important part, about which very little is known at present. For instance, in photogravure, where gelatin images are mounted on polished copper surfaces and then etched with a ferric chloride solution which dissolves the copper, it is common to hear preferences expressed for either electro-deposited copper or for rolled copper. This is because the two surfaces etch differently, owing to the differing crystal structures at the surface, but the relationship between the two has not been determined.

In the case of half-tone block-making, where copper or zinc are etched with nitric or hydrochloric acids, further investigation of the actual etching would probably not be of value, since there is nothing to complicate the direct reaction of acid and metal. In this case, the photographically-produced resist which makes the picture consists of dots or a network of dots with clear metal between; this resist is formed of tanned glue, which is then " burnt in " or " enamelled " by heating in a Bunsen flame. If properly carried out, the glue first passes through a spongy stage and then becomes an enamel which is quite impervious to acids; if heated still further, the enamel chars and breaks up. The changes taking place here are not clearly understood, and the proper performance of the process requires considerable skill. Hence many attempts have been made to find a " cold glue " which would give an acid-proof image without heating. Very little success was achieved until the introduction of light sensitive artificial resins comparatively recently, and these have not yet had the success originally predicted, again probably because the chemical changes taking place are obscure.

Photogravure

In the case of photogravure, referred to above, the resist must not be impervious, since it extends right over the picture, the gradation being made up by varying thicknesses of gelatin. The etching fluid is a concentrated solution of ferric chloride, which diffuses through the gelatin relief image, the etching obviously being greatest where the gelatin is thinnest. In a process such as this there are numerous problems connected with the rate of diffusion of various strengths of ferric chloride, the diffusion away from the metal of the products of the reaction, the relation between thickness of gelatin relief and penetration of various etching baths, etc., on some of which Cartwright (*Photographical Journal*, **61** (1921), 428–432; *Proc. 7th Int. Cong. Phot.* (1928), 393–405), has published useful information, which, however, would be difficult to summarise here. Nevertheless, many aspects of this fascinating problem still await attention.

Despite the fact that gelatin and glue compositions have been transferred to, or coated on, copper for years in various branches of the printing trade, very few people seem to have realised that there is a direct chemical action at the surface separating the two, a reaction which leads to the surface tanning of the gelatin. This is exactly equivalent to fog on a photographic image, and results in a degradation of contrast, except in some cases where the fog is actually broken down during the etching, but even here it prolongs the process unnecessarily, and would be much better eliminated. This subject was investigated by Cartwright and Tritton (*Photographic Journal*, **67** (1927), 403–408), who showed that it could be eliminated by silver or gold plating the copper in the simplest possible manner by immersing it in, or sponging it over with, a silver cyanide plating bath. Similar interaction is said to occur between zinc and glue (F. Ullmann, Brit. Pat. 288,023), but it is not so obvious and has not been so fully investigated.

This brief sketch obviously only mentions a few of the problems to be found in photomechanical printing, and, as in so many other applied sciences, the more such processes are investigated the more complicated and the more fascinating do they become.

What the B.A.C. is Doing

WRITING to the *Chemical Practitioner*, a member of the British Association of Chemists states: " I have heard of various members of the association who, whilst they have been members since the formation of the association, had not seen, and could not see, the B.A.C. doing anything for them or any other chemist. In my own case I joined whilst in an apparently permanent position, and insured myself against what at that time seemed remote unemployment. In time, due to circumstances outside my control, I became one of the ' great army ' and received during a period of six months over £100 from the unemployed section of the B.A.C. Still failing to get a job I was encouraged by the good fellowship extended by the various B.A.C. members I met, until, finally, I found a suitable post through the B.A.C. appointments bureau, and am now in receipt of more than the recognised minimum of salary.

" Another activity of the association I discovered to be useful, and that is the gathering of the clans at concerts and various other social functions. These allow of intercourse between members who would otherwise never meet, and make for interesting and helpful conversations of mutual interest not only to the B.A.C. but to the profession in general. But the society relies at all times upon prompt payment of subscriptions, and it is a remarkable fact that complaints generally come from men who admit to arrears, or who are never seen at the various functions arranged by the committees and officers."

The Use of Fast Dyes

An Outline of Historical Development

In the course of a lecture delivered on Monday in London, under the auspices of the Textile Association, on "Vat Dyes, or what should the purchasing public understand by fast dye," Mr. James Blair, B.Sc., said that it might appear from the title of the lecture that the purchasing public should understand that by the term "fast dye" they should mean "vat dye." This was only correct in certain instances, as, for example, casement cloth, blouse and shirt fabric, and handkerchief cloth. He proposed to tell what vat dyes were and also what other classes of dyes came up to the public's present idea of fastness. The demands were satisfied to a large extent by the use of vat colours, but they could not be applied to all materials.

No Perfectly Fast Dyes

Nor was it so easy to match shades with vat dyes as it was with other classes of dyestuffs which might be only slightly inferior in fastness to the vat dyes. He wished to say first that there was no such thing as a perfectly fast colour; no colour was absolutely fast to anything, even in the best cases. Dyes were complex organic compounds which were synthesised by the chemist, and conversely could be broken down either by oxidation or reduction.

Everybody had purchased packet dyes in various forms for home dyeing. These dyes dissolved and gave a coloured solution, and when a warm bath was made up, they dyed or stained any fabrics placed in the bath. A vat dye, placed in water, would just float or sink, and not colour the water at all

Leuco Compounds

The soluble form of a vat dye was known as a leuco compound. The so-called leuco compounds were obtained by treating the dyes with reducing agents in an alkaline medium such as hydrosulphite. Whilst in the form of this leuco compound, the dye had affinity for the fibre, and by subsequent oxidation in the air, or by means of chemical oxidising agents, the original insoluble form was reverted to. That to some extent explained the fastness.

There was a great deal of romance in the history of the organic chemical industry. Seventy years ago, coal tar was practically a waste product, but the chemist working in the laboratory with his retorts and test tubes had built up an industry which was recognised as perhaps the most important key industry there was, for not only were dyes made which brought colour into every aspect of life, but drugs and pharmaceutical products were made which gave health and relieved pain.

About a hundred years ago, Friedrich Wöhler, a German chemist, made urea in the laboratory, the first of the products to be synthesised which had hitherto been obtained from nature. Thirty years later, a young student named Perkin, 18 years of age, was attempting to make quinine, when he obtained, by the oxidation of aniline, a violet-coloured powder, named "mauve," or "Mauvine," the first aniline dye. That was tested at Pullars' Dye Works at Perth, and led to the formation of the early dye industry in England, first Perkin and Sons, afterwards Brooks, Sampson and Spillers, William Thomas and Dover, and Roberts, Dale and Co. Professor Hofman, at the Royal College of Chemistry, played a very important part in the achievements of those early organic chemists.

Dye Manufacture in Great Britain

Dye manufacturing continued in this country, and some additions to the range were made. In the early days, very few dyestuffs were made, but they made aniline and paranitraniline, which were of great importance for blacks on cotton and para reds. In 1864, Clavel commenced making basic dyes at Basle, and in 1885 the Society of Chemical Industry was founded there. Although the industry rather languished in England, it forged ahead on the Continent. In 1868, Graebe and Liebermann made alizarine, the colouring matter of madder, from dibromanthraquinone, and in 1870 the B.A.S.F. placed synthetic alazarine on the market. That was followed by alazarine blue, black, red, and fast dyes for wool and cotton. Until 1897 indigo was obtained exclusively by the fermentation of the indigo plant, but since the discovery of the aniline dyestuffs, the efforts of chemists had been directed to producing this dye synthetically, and by 1914 one could say that synthetic indigo had practically replaced the natural product.

Indigo was generally looked upon as a very fast dyestuff. On wool in a heavy shade of navy it was certainly very good to light, and in a table of light fastness where the figure 1 was taken as the highest degree of fastness, and 8 as the poorest, indigo was marked as 1; but in light sky-blue shades, it was not exceedingly fast, and would be marked down. The beauty of indigo was that it always faded pure, and kept its tone, whereas other dyes turned greyer or redder. A change of shade made a colour appear more fugitive than it probably was. Indigo on cotton was nothing like so fast as it was on wool, but again it faded pure, and the great advantage was that no matter how often it was washed, the shade always retained its blueness, despite loss of depth.

Vat Dyes

It would be realised that vat dyeing was purely a deposition of the pigment on the fibre. Other wool dyestuffs, when they were dyed, actually combined with the fibre, so that after dyeing wool in an acid dyestuff bath, one was left with a perfectly clear liquor. The first vat dyes of the anthraquinone class were discovered in 1901, which opened up quite new possibilities in vat dyes, and indigo itself was converted into soluble derivatives by a variety of means. In 1909, Friedlander made the remarkable discovery that the purple of the ancients, Tyrian purple, which was derived from a species of shellfish, was actually 6:6-dibromoindigo. That product had been made in 1903, and in spite of its very historical interest, the dyestuff is not produced commercially to-day, as the shade could be obtained in other ways at considerably less cost.

The Society of Chemical Industry in Basle accomplished very great progress in the manufacture of Ciba dyes, which were derivatives of indigo. Sulphur was first combined with indigo, making the thioindigo series, like thioindigo red. Subsequently the bromine molecule was introduced into the structure, and vat blues appeared, and other compounds were made by halogenating the thioindigo series. Washing was very important to remove all superficially attached colour. Soaping also tended to brighten the shade. The degree of fastness amongst vat colours varied just like other classes of dyestuffs.

Guaranteed Fabrics

In 1901, indanthrene blue was prepared by heating β-amino-anthraquinone with caustic potash. That was the first of what were generally understood by vat dyes to-day. The introduction of guaranteed fabrics, such as casement cloths, blouse and shirt fabrics and handkerchief cloths, certainly gave a big fillip to the manufacture of vat colours, and it was in those fabrics that the best anthraquinone vat colours were used. The difference in the cost per yard of fabric dyed with vat colours, and with ordinary direct colours, did not amount to much even in a good solid shade. It would be nothing like 6d., which was perhaps the difference in the cost of dyeing, and not in the cost of dyestuff. The price of guaranteed fabrics was so arranged that the cost of returns and replacements was covered in the original price.

A recent development in the vat colours was the invention of Indigosol by the Durand Huguenin Co. That was a stabilised leuco compound, or more correctly the stable leuco ester of indigo. It would dye wool and silk like an ordinary acid dyestuff, and after dyeing the leuco compound, it was spilt on the fibre by treatment with nitrous acid, and the insoluble product obtained gave a shade indistiguishable from vat-dyed indigo, and equally fast.

Continuing, the lecturer said that with regard to a fabric dyed with a fast dye, all that could be said at the moment was that a selection of dyestuffs had been made which represented the highest degree of fastness to give that particular shade, and a compromise had been made in light, washing and other fastnesses to give reasonable satisfaction for the time that the material was required to be in use. One reason why vat colours were not used on wool was that the alkaline bath, even if means were taken to prevent any apparent destructive action, seemed to affect the wear of the material.

Manchester Paper on Peter Griess

His Work on Diazo Compounds

A MEETING of the Manchester Section of the Society of Dyers and Colourists was held on Friday, November 15, in the Lecture Room of the Manchester Literary and Philosophical Society, Mr. G. E. Holden presiding. A paper entitled "Peter Griess" was read by Dr. F. A. Mason.

Dr. Mason said that September 6 was an important date for Manchester citizens, for on that day was born the famous chemist, John Dalton, founder of the modern atomic theory; but the day was also sacred to the memory of another chemist, Johann Peter Griess, born just a century ago, whose name was probably unknown to most readers of the *Manchester Guardian*, but whose discoveries in organic chemistry and the chemistry of the azo dyes had largely revolutionised the methods of preparing and applying the coal tar colours. We should probably not be far wrong if it was said that 50 to 60 per cent. of the synthetic colours manufactured and used at the present time belonged to the azo dye class, and owed their inception to the purely scientific researches of this remarkable man.

Education

Peter Griess was the son of a fairly well-to-do farmer in Kirchhosbach, near Cassel, Central Prussia, and was born in that village on September 6, 1829. Intended originally by his father to follow in his footsteps, young Griess soon found the plough and byre too tedious for his liking, and eventually persuaded his parents to let him study at the university. Although a lad of high talents, study was perhaps hardly the correct description of his activities at Munich and Marburg, at which latter University his endeavours, aided and abetted by his fellow members of the Corps "Franconia," to make a "Bigger and Brighter Marburg," were more noticeable than his attendance at lectures. On one occasion, at all events, it is said that the audience awaiting the performance by a travelling circus had to be told that the show was cancelled as the members of Griess's Corps had "borrowed" all the horses for a day in the country, taking with them also the ladies of the chorus.

At long last, however, Peter reformed, and in his sixth year at the university took up quite seriously the study of chemistry, without, however, distinguishing himself in any way. After a short spell at a tar distillery at Offenbach-am-Main, Griess in 1858 met the famous German professor of chemistry, A. W. von Hofmann (the teacher of Sir W. H. Perkin), who was in charge of the Royal College of Chemistry in London (long since merged into the Royal College of Science). Griess so impressed Hofmann that he was invited to come to work in the London laboratories, and his professor told an amusing tale of the early arrival one day of a strange figure in a red brown overcoat, sea green unmentionables, and a bright red knitted scarf, the whole surmounted by a top hat of a size and shape never seen before or since in that locality.

The Diazo Compounds

Griess devoted himself very largely to the examination of the strange new reaction, known now by his name as the "Griess Reaction," which consisted in treating certain aromatic amino bodies with nitrous acid, whereby new and highly reactive derivatives were formed, for which he coined the name "Diazo Compounds." Griess soon found that these substances could undergo innumerable changes, leading to wonderfully simple methods of preparation of many very important substances, otherwise difficult to make, and these reactions are used to-day in every laboratory and chemical works the world over. But, in addition, it was gradually found by Griess, and other chemists in England, France and Germany who followed in his footsteps, that these amazing diazo compounds would combine with the greatest ease with other coal tar products of all descriptions, especially with derivatives of naphthalene, to yield dyes of hitherto unknown fastness, beauty and ease of application.

Griess showed, moreover, for the first time, that it was possible to prepare dyes which would dye cotton directly without any preliminary mordanting or other treatment, and so started the manufacture of the large and extremely important class of direct cotton dyes, which fill so important a position in the dyeing and printing trades. Indeed, it is difficult to imagine what would be the present position of the textile industries without the discoveries made by Griess and his followers, and it is even more remarkable when one considers that from 1862 to the end of his life Peter Griess was employed as a chemist at Allsopp's Brewery at Burton-on-Trent, becoming chief chemist there, and all his later discoveries, which have revolutionised an industry with which he never had more than a slight acquaintance, were made by him practically single-handed in the intervals that he could snatch from his more pressing official duties.

Academic Researches

Griess was not himself in any way a technical chemist except in relation to brewing, and his researches were of what might be called the academic variety, but by his attention to strict scientific accuracy he laid so well the foundation of the azo dye industry that it has remained for other chemists only to build steadily upwards, secure in the knowledge that the basis of their achievements is sound.

Griess did not succeed in making any money from his discoveries, as is so often the way, and one of the few technically successful dyes prepared by him was only put on the market just after his death at Bournemouth, on August 30, 1888.

Gold Medal for Textile Chemistry

To the Editor of THE CHEMICAL AGE.

SIR,—In order to stimulate the interest of regular chemistry students in textile chemistry, to bring to their attention the need of chemists in the textile industry and the opportunities for research in this field, I have decided to offer a gold medal each year in various colleges and universities, or groups of these, for the best thesis upon some phase of chemistry as applied to the textile industry. My reason for publishing this open letter is to learn how many colleges will be interested in this project and to secure the co-operation of the interested faculties in formulating the conditions governing the award, as well as in selecting a suitable design for the medal.

Roughly, the present idea is to grant the medal for the best thesis submitted upon some piece of original research concerning any phase of chemistry in the textile industry. This research may be either in the laboratory or in the literature. In order to be eligible to submit a thesis in this contest, the student must have a satisfactory standing in all classes or a satisfactory average, and the thesis must be in such shape as to be suitable for publication.

Theses accepted will be published, if possible, in one of the textile journals, whether winning a medal or not, with details regarding the student. The young man will receive regular rates for this material from the journal, and it is hoped that this may lead him to a position in the textile industry. There will be no limit as to how many theses may be submitted from any one institution. It will be decided later whether it will be best to offer a medal in each institution interested, or to divide the institutions into classes according to size, location or otherwise.

I shall be glad to have the opinion of all interested chemistry teachers on all of these points, as well as suggestions as to rules, designs, etc.—Yours, etc.

CHAS. E. MULLIN.

Clemson College, South Carolina, U.S.A.
October 29.

The Kekulé Memorial Book

IN celebration of the centenary of the birth of August Kekulé, the eminent German chemist (born on September 7, 1829, in Darmstadt), the Verlag Chemie G.m.b.H., of Berlin, has published a two-volume life, written by Professor R. Anschütz, one of Kekulé's students. The first volume (pp. 732) deals with Kekulé's life and work; the second (pp. 976) with his scientific papers, reports, articles, speeches, etc.; and the price is 120 marks. The production, printing and binding of the volumes can only be described as sumptuous. The first is profusely illustrated, the pictures including not only Kekulé and his circle, but various groups of great interest. In the labour and care lavished on the production of these volumes, Professor Anschütz and the publishers have fittingly commemorated the immense services rendered by Kekulé to organic chemistry.

A Bookman's Column

MR. ALFRED B. SEARLE has compiled an *Encyclopædia of the Ceramic Industries*. It is to be published in three volumes by Ernest Benn, Ltd., at nine guineas the set. Volume I, price three guineas, has just appeared, and deals with subjects coming under the letters A—E (pp. 391). This work is intended to be a guide to the materials, methods of manufacture, means of recognition and testing of the various articles produced in the clayworking and allied industries, including clays, silica, felspar, bricks, tiles, pottery, porcelain, pencils, refractory materials, and many others, arranged in alphabetical order for rapid reference by manufacturers, research workers, students, connoisseurs, and others.

* * *

The importance of a knowledge of hydrogen-ion concentration in chemical reactions and processes is receiving wider and wider recognition. A warm welcome will, therefore, be extended to the first British treatise on the subject, *Hydrogen Ions*, by Dr. H. T. S. Britton, published by Chapman and Hall (pp. 515, 25s.). The author's object is threefold: firstly, to provide a practical discussion of the various electrometric and colorimetric methods of determining the concentration of hydrogen ions; secondly, to show the fundamental importance of hydrogen-ion concentrations in general chemistry, including volumetric and gravimetric analytical procedures; and, finally, to indicate the important rôles played by hydrogen-ion concentrations in numerous industrial chemical processes, and how the various methods of measuring hydrogen-ion concentration have been employed for the purpose of control.

* * *

An unusual and interesting book has just been published by Edward Arnold and Co., i.e., *The Elder Pliny's Chapters on Chemical Subjects, Part I*, edited, with translation and notes, by Dr. Kenneth C. Bailey, of Trinity College, Dublin (pp. 249, 12s. 6d.). This consists of a reprint of matters of chemical interest contained in Pliny's great "Natural History." The Latin text is printed on one side and the English translation opposite, while numerous notes are provided for the reader's edification. Among the substances mentioned are Tyrian purple (the famous dyestuff of the ancients, which was shown by Friedländer to be 6:6-dibromindigo) and alizarin (then obtained from the madder plant).

* * *

"An elementary knowledge of the principles upon which the law is founded must be considered an essential part of the mental equipment of every man who aspires to administrative responsibility." With these words, which will be received with general agreement, Mr. G. S. W. Marlow, B.Sc., F.I.C., barrister-at-law, begins the preface to his book, *Law and Industry*, just published by Baillière, Tindall and Cox (pp. 319, 18s.) About the need for such a book there can be no doubt; and while it is written quite generally for those engaged in industry of whatever kind, the chemical interests of the author are bound to recommend it to those engaged in the chemical industry. Some idea of its scope may be obtained from a perusal of the chapter headings:—Introduction; Torts; Contracts; Principal and Agent, Master and Servant; The Factory Acts; Employers' Liability and Workmen's Compensation; The Prevention of Pollution; Trade Unions and Trade Boards; The Sale of Goods; Special Cases of the Sale of Goods; Carriage of Goods; Contracts of Insurance; Negotiable Instruments; The Companies Act; Bankruptcy; Monopolies (this chapter being concerned with letters patent, trade marks, registered designs, and copyright).

* * *

THE ninth edition of *A Pocket Book for Chemists*, chemical manufacturers, metallurgists, dyers, distillers, brewers, sugar refiners, photographers, students, etc., by Thomas Bayley, edited by Robert Ensoll, has just appeared (E. and F. N. Spon, pp. 460, 8s. 6d.). The contents are divided into seven sections, as follows: Mathematical, weights and measures, physical, general analysis, gravimetric analysis, volumetric analysis, and miscellaneous. By the use of suitable paper and type the book has been reduced to conveniently small size.

Western Viscose Silk Mills

Reconstruction Scheme

A SCHEME for the reconstruction of Western Viscose Silk Mills (in voluntary liquidation) is submitted by the shareholders' committee, under which a new company is to be formed, with a capital of £400,000, in £1 ordinary shares. The directors are to be appointed by the shareholders. Subject to sufficient financial support, the present committee is to negotiate with the Receiver (Mr. Bond) to purchase the assets on the best possible terms. The new company is to allot one ordinary share of £1, credited with 15s. paid up, for every old fully-paid non-cumulative preference share, and is to allot for every ten old fully-paid deferred shares of 2s. each one ordinary share of £1, credited with 14s. paid. The reason that the holders of a deferred share are asked to pay 1s. more per ten shares than the holder of preference shares, is to adjust in some way their respective values.

The committee and/or the proposed board are to be at liberty to dispose of any shares not accepted by shareholders entitled thereto on terms which it is trusted will be favourable to the new company, but full consideration will be given to all shareholders who are desirous of participating in any surplus shares. The committee understand that there will be complete exemption from capital duty to the extent of the amount credited as paid up on the shares which shareholders take up, and exemption from *ad valorem* stamp duty on the transfer of the assets. There is, furthermore, nothing to prevent the new company at any later date from creating additional capital and issuing it for cash.

New Company's Programme

The committee have every reason to state that, given sufficient support, the new company will have as chairman, subject to the approval of the shareholders, a director of the highest commercial reputation, and prominently connected with the rayon industry.

The programme would be to consider the starting up of the works when trade and prices are better; to be in a position to realise the assets for the benefit of the shareholders; to continue negotiations with a firm of good financial standing for the manufacture of staple fibre, and to continue negotiations with one of the present rayon firms for the use of the Bristol mills for the extension of their business. There are still many opportunities, it is stated.

Society of Chemical Industry

Birmingham and Midland Section

THE following programme has been arranged by the Birmingham and Midland Section of the Society of Chemical Industry, for the Session 1929-1930: December 5—"Petroleum Hydrocarbons as Chemical Raw Materials," by Mr. H. M. Stanley, at the Chamber of Commerce, New Street, Birmingham; January 21—"Chrome Plating," by Mr. E. J. Dobbs, at the Chamber of Commerce, Birmingham; January 25—Midland Chemists' Dinner, Midland Hotel; February 7—"Electric Furnaces for Heat Treatment," by Mr. A. G. Lobley, Chamber of Commerce, Birmingham; March 6—Contribution from the University Department of Chemistry, The University Buildings, Edmund Street; March 20—"A Wood Distillation Factory in Jugoslavia," by Dr. W. R. Ormandy, Chamber of Commerce, Birmingham, preceded by annual meeting of Section; April 3—"Contribution to our Knowledge of the Polysaccharides Starch and Glycogen," by Professor A. R. Ling, Chamber of Commerce, Birmingham. There will also be a visit and informal dinner, details of which are to be announced later.

The Chairman of the Section is Mr. W. A. S. Calder. Dr. H. W. Brownsdon, Dr. E. D. Mason and Mr. A. W. Knapp are the vice-chairmen, and the members of the committee are Mr. W. R. Barclay, Dr. W. M. Hampton, Mr. H. W. Hewis, Mr. T. C. Humphreys, Mr. J. R. Johnson, Mr. A. A. King, Mr. C. W. Mobberley, Mr. D. W. Parkes, Mr. R. W. Rowell, Dr. W. Wardlaw, and Mr. A. G. R. Whitehouse. The hon. treasurer is Mr. W. T. Collis; hon. auditor, Dr. C. A. Fox; representative on Chemical Engineering Group, Mr. A. J. Broughall; and hon. secretary, Mr. G. King, 25, Whitmore Road, Small Heath, Birmingham.

The Nitrate Position

Comparison with the Past

MR. H. S. WOOLF, director of Aikman (London), Ltd., in a letter to the *Financial News*, makes the following comments:

"At the Aguas Blancas Co. meeting, the chairman gave the shareholders some statistical figures which, in our opinion, present the situation in unnecessarily sombre colours. This is not altogether surprising, as, according to the report of the meeting in the *Financial News*, the foundation of his calculations was the assumption that the visible stocks at October 30 last amounted to 2,555,000 tons. The correct figure is, however, 300,000 tons less, namely, 2,250,000 tons.

"He further compares the visible supply at October 30 this year with the visible supply at October 30, 1913, with the result that he shows an increase of 1,000,000 tons. We suggest that the two figures provide no useful comparison, as the conditions of the trade are entirely different. In 1913 we had a free trade and an open market, while to-day we have a controlled trade and centralised selling. Between the two periods, the centres of consumption, and with them the whole basis of the requirements of supplies and stocks, have also entirely changed. In 1913, Germany took 800,000 tons a year, compared with about 100,000 tons last year. In 1913 Egypt took 55,000 tons, compared with 179,000 tons, and America in 1913 took 553,000 tons, against 975,000 tons in 1929. We give these few figures for the purpose of showing how the conditions of the trade have changed, and to indicate how impossible it is to form a proper view of the situation by comparing to-day's figures with those of sixteen years ago.

"As we have stated above, the visible stocks at the end of October last were 2,250,000 tons, which should be compared with the visible stocks at October 30, 1928, of 1,805,000 tons, showing an increase of only about 450,000 tons. If the restriction of production to which the chairman of the Aguas Blancas Nitrate Co. referred is carried through—and we see no reason why it should not be—the figure of reduction aimed at would probably be the moderate surplus given above.

"We would also point out that one of the features of the present system of centralised selling is that the stocks throughout the world should at all times provide for any possible demand from consumers. Stocks to-day must therefore be larger than they were in the days when merchants adjusted their holdings of nitrate to their views of the immediate tendency of the market."

British Standard Specifications

Hardness of Steel Balls for Brinell Hardness Testing

THE British Engineering Standards Association has just published a standard specification for the hardness of steel balls for Brinell hardness testing, Part II of B.S. Specification No. 240. This specification forms the supplement to the Report on Brinell Hardness Numbers which was issued in 1926, and in which a note was added indicating that the specification for the hardness of the balls would be prepared. This information embodied in the specification has been based upon the results of research which was carried out at the National Physical Laboratory. Recommendations as to the hardness of the balls to be used in testing materials of varying hardness is indicated, and tables are given from which the hardness of balls can be determined by means of the diamond, indentation test and reciprocal pressure test.

Copies of this specification can be obtained from the British Engineering Standards Association, Publications Department, 28, Victoria Street, London, S.W.1, price 2s. 2d. post free. It is referred to as No. 240, Part 2, 1929.

Sir Ernest Benn and Export Trade

WRITING to *The Times* of November 16, Mr. Charles Gane, Chairman of the Anglo-Finnish Section of the London Chamber of Commerce, states:—"The letter from Sir Ernest Benn in your issue of the 9th pointing out the disparity of trade between Great Britain and certain Scandinavian and Baltic countries is apposite and deserving the attention of the business community. Sir Ernest has done excellent service by his journey, and I know his eloquent speeches in trying to promote British trade have everywhere been received with acclamation and a cordial desire to buy more British manufactures."

Civil Service Inquiry

No Representative of Science on Commission

IN the House of Commons on November 6, Lieut.-Col. Fremantle had down the question: "To ask the Prime Minister if it is the intention of His Majesty's Government, in appointing the Royal Commission on the Civil Services, to review the status and functions of the large body of scientific and technical experts engaged in the Civil Services, with a view to the furtherance of scientific knowledge, methods, and research of those services; and if, seeing that there is no representative of science nor anyone engaged in the application of science to the needs of the community, he will consider the addition to the Royal Commission of a due proportion of such representatives." The answer given by the Chancellor of the Exchequer was: "The Royal Commission has been appointed to inquire into, and report on, the structure and organisation of the Civil Service, conditions of employment of Civil Servants, and conditions of retirement from the Civil Service. Its terms of reference have been widely drawn, and it will be for the Commission itself to determine the extent to which the various subjects within the scope of the reference can profitably be reviewed. I am satisfied that the Commission as now constituted is well adapted to the purposes of the inquiry, and I am not prepared to enlarge its numbers."

In a note on this matter, *Nature* makes the following comment: "As often occurs in Parliamentary replies, the main point of Colonel Fremantle's question is evaded. The first sentence merely summarises the terms of reference, and the second asserts that the Commission is capable of determining their scope. When, however, it is stated that the Commission 'is well adapted to the purposes of the inquiry,' we dissent most strongly. In the selection of its members no consideration seems to have been given to the necessity of including anyone who understands what science and research mean in the State service. Such subjects as relative rates of pay for men and women, position of ex-Service men, and so on, will no doubt be well represented in evidence and carefully judged by the Commission, because no special knowledge is required to comprehend them. We have far less confidence, however, in the ability of the Commission to appreciate the significance of the scientific and technical sides of the Civil Service and to place them in such correct adjustment with the administrative branches as is demanded by modern conditions."

A Remarkable Will

MR. HENRY ALFRED WADWORTH, of Breinton Court, Hereford, a member of the North Hereford and South Hereford Hounds, who met with a fatal accident on August 25 last, left £37,724, with net personalty £34,543. His will included the following statement:—

"I believe (and some of the leading scientific men of the day assure me that I believe rightly) that at my death the organic constituents of my body will be quickly converted into carbonic acid and ammonia, and that those gases will, by the law of diffusion, be at once distributed over the whole world and will help to build other plants and in their turn animals, so that in the future every plant and animal in the world will contain an infinitesimal portion of my body.

"The inorganic parts of my body, the phosphates of lime, etc., will also be dissolved, and by the agency of rains, rivers, and ocean currents will also be distributed, but more slowly. The energy left in my body after death degraded to heat will quickly leave it and form part of the energy of the universe. This I believe to be the true Resurrection of the Dead and the Life Everlasting. I believe in God, but like the God of St. Paul's Greeks, it is an unknown God, as in our present state of development we are incapable of understanding Him."

Society of Public Analysts

THE next meeting of the Society of Public Analysts will be held on Wednesday, December 4, at the Chemical Society's Rooms, Burlington House, Piccadilly, W.1, at 8 p.m. A lecture will be given by Professor A. P. Laurie on "The Methods of Examining Pictures," and the following papers will be read if time permits:—"The Determination of Minute Amounts of Iodine in Soils and Waters," by R. L. Andrew, and "The Quantitative Analysis of Mixtures of Nickel and Cobalt," by S. Glasstone and J. C. Speakman.

Housing by Individualist Enterprise

What the Housing and Town-planning Trust Has Done

A FEATURE of the 28th of the series of monthly Individualist Luncheons, held on Wednesday, November 13, at the Hotel Cecil, London, was the return of Sir Hugh Bell to the chair after an absence of many months, occasioned by his long illness. Sir Hugh, in introducing the principal speaker, Sir J. Tudor Walters, M.P., said that there was not a moment in the history of the country in which individualism was more important than it was to-day; on every side they had the Government attempting to interfere with their liberty, and he would like to ask Sir Tudor how the difficulty of building a house without this interference of Government officials could be successfully overcome.

Sir Tudor Walters's Great Work

Sir J. Tudor Walters, at one time chairman of the Committee on Housing and now President of the Housing and Townplanning Trust, said that it would be a surprise to many people to learn that there was such a thing as private enterprise in housing; many imagined that to-day the only new houses were council houses. The first Industrial Housing Association which was formed for the erection of houses in Yorkshire, Nottingham and Derby, had built 12,000 houses in four years, and simply with the aid of the State loan it was able to build houses without subsidy, and, which was more, had earned and paid the dividends on the loan, and had been left with annual surpluses that were being expended on the provision of public baths, hospitals, welfare centres and other amenities. Some of these houses were parlour and others non-parlour houses, each with a good kitchen-scullery, three bedrooms, central heating, and electric light at 1/5 of a 1d. per unit, not to mention adequate provision for the perambulator. The rent was in many cases as low as 7s. 6d. per week. The Second Industrial Housing Association had built another 10,000 houses, and was able to provide a non-parlour house at a rental of 6s. There were ten houses to the acre, with children's playgrounds in central squares away from the traffic. Financially, this scheme was more successful than the first. Now No. 3 scheme for 10,000 houses was on the way.

The difficulties facing those who set out to provide housing accommodation could be surmounted, without troubling the State, by private enterprise. He did not believe there was any need for subsidies for building houses. A house could be built by private enterprise within the rental capacity of the worker.

Sir Ernest Benn on Liberty to Build

Sir Ernest Benn said that a great nation was spending millions a year in educating a great people for whom we had made no adequate provision. He did not believe that our children would be content to live in the houses that many lived in to-day. Sir Tudor's great achievement had been to pick his way through over three hundred Acts of Parliament and to overcome the barriers in his path. In voicing the need for individualism in housing, the liberty to build, they could not do better than try to get rid of the restrictions which surrounded the building of a home.

Imperial Chemical Industries

New Issues Completed

THE large issue of new capital by Imperial Chemical Industries, Ltd., offered to the shareholders in May last—viz., 4,410,595 preference shares and 6,016,857 ordinary shares, involving a subscription of £15,150,419 in cash—has now been successfully completed. The final instalment, which was due on the 4th instant, called for a payment of £4,061,378, and was virtually completed within four days of that date.

The success of this large-scale capital flotation may no doubt be attributed in part to the wide distribution of the ownership of the shares, there being at the present time over 154,000 shareholders on the register. It is none the less a remarkable tribute to the soundness of the financial structure in this country, and striking evidence of the silent confidence of investors in British industrial activities at a time when stock markets throughout the world are suffering from the acute depression arising out of the calamitous collapse of the American market.

Chemical Matters in Parliament

Artificial Cream Act

MR. LAWTHER (House of Commons, November 14) asked the Minister of Health if his attention had been called to the proceedings at Marlborough Street Police Court on July 2 and 12, and the subsequent appeal at the London Sessions on September 13, when it was decided that the Artificial Cream Act could not apply as the case had not been brought forward by an official of a local authority but by an outside authority; and would he be prepared to bring forward legislation empowering individuals to seek protection under the said Act where county or borough councils failed to carry out their statutory duties? Mr. Greenwood said that he was aware of the proceedings referred to, but he could not undertake to introduce amending legislation on the subject at the present time.

Cement, Lime and Whiting Manufacture

Replying to Sir R. Gower (House of Commons, November 18) Mr. Lawson (for the Minister of Labour) stated that at October 21, 1929, the latest date for which figures were available, the number of insured persons, aged 16 to 64, classified as belonging to the cement, lime and whiting industry recorded as unemployed in Great Britain wa 1,521, of whom 1,177 were wholly unemployed and 344 temporarily stopped from the service of their employers.

Fuel Research

Mr. Buchanan asked the Lord Privy Seal (House of Commons, November 19) if he had had brought to his notice the Turner scheme for treating coal; if he was aware that, according to certain official authorities, work could be found by this method finding employment for 300,000 men; and whether the scheme was being further inquired into? Mr. Thomas said the answer to the first part of the question was in the affirmative, and to the second part in the negative. With regard to the third part of the question, a test of the existing Turner plant had been carried out by the Director of Fuel Research under the published schemes for testing such plants.

Exemptions from Key Industry Duty

THE Treasury have made an Order under Section 10 (5) of the Finance Act, 1926, continuing the exemption from duty of methyl chloride till June 30, 1930, and of the following articles till December 31, 1930:—Acid hydrocyanic anhydrous; acid lactic which satisfies the requirements of the British Pharmacopœia; acid oxalic; amidopyrin (pyramidon; dimethyl-amidoantipyrine); ammonium perchlorate; barbitone (veronal; malonal; malourea; acid diethyl barbituric; diethylmalonylurea; hypnogen; deba); bromural (dormigene); celtium oxide; chinosol; cocaine crude; dial (acid diallyl barbituric); dicyandiamide; didial (ethyl morphine diallyl barbiturate); dysprosium oxide; elbon (cinnamoyl para oxyphenyl urea); erbium oxide; ethylene bromide; eukodal; europium oxide; furfurol; gadolinium oxide; glycol ethers; guaiacol carbonate (duotal); holmium oxide; hydroquinone; integrators (planimeter type); R. lead acetate; lead tetraethyl; lipoiodin; lutecium oxide; metaldehyde; methyl cyclohexanol methyl adipate; methyl sulphonal (diethylsulphonemethylethylmethane, trional); nickel hydroxide; papaverine; phenacetin (acetparaphenetidine); phenazone (antipyrine; phenyldimethylpyrazolone; analgesin; anodynine; dimethyl oxychinizin); phenetidine para-; phytin; piperazine (diethylene-diamine; dispermin); planimeters; R. potassium chlorate; potassium ethyl-xanthogenate (potassium xanthogenate); potassium guaiacol sulphonate (thiocol); R. potassium hydroxide (R. potassium caustic; R. potassium hydrate); R. potassium permanganate; pyramidon-veronal; quinine ethyl-carbonate; radium compounds; resorcine (resorcinol); salol (phenyl salicylate); samarium oxide; styracol (guaiacol cinnamate); sulphonal; synthalin; terbium oxide; thulium oxide; urea (carbamide); vanadium-silica compounds specially prepared for use as catalysts for sulphuric acid manufacture; ytterbium oxide. The Treasury Order will shortly be published by the Stationery Office.

Appointments Vacant

THREE SHIFT MANAGERS, an electrical engineer and a mechanical engineer, for an Indian Chemical Works. Details on p. xx

From Week to Week

LORD MELCHETT has issued a request that for the present all personal correspondence should be addressed to him at 35, Lowndes Square, London, S.W.1.

THE TWO FACTORIES of the Lincolnshire Beet Sugar Co. at Bardney and Brigg have now reached their peak of production, and are dealing each day with a joint average tonnage of 2,400.

THE DIRECTORS OF MOTOR FUEL PROPRIETARY announce that the erection of the new continuous plant is finished, and within a few weeks it is expected that the retorts will be ready to receive their first charge of coal.

DISEASES OF OCCUPATIONS reported during October under the Factory and Workshop Act included three cases of aniline poisoning and eleven cases of chrome ulceration (4 in dyeing and finishing, and 7 in other industries).

THE SPANISH GOVERNMENT, in pursuance of the policy of establishing control of industry and production, is considering the possibility of the regulation of the output of certain minerals, such as iron and potash. It is thought that by so doing the price could be steadied.

UNIVERSITY NEWS : *London.*—The following doctorates have been conferred : D.Sc. in chemistry on Mr. H. J. Emeléus (Imperial College—Royal College of Science), for a thesis entitled "The Glow of Phosphorus and Allied Phenomena," and on Mr. I. Vogel (Imperial College—Royal College of Science), for a thesis entitled "Carbon Rings."

PROFESSOR H. FREUNDLICH, of the Kaiser Wilhelm Institute for Physical Chemistry and Electrochemistry, will deliver the second Liversidge Lecture of the Chemical Society on December 12, taking as his subject "Surface Forces and Chemical Equilibria." The lecture will be given in the hall of the Institution of Mechanical Engineers, London.

MR. A. H. DAVIS, chairman and managing director of A. H. Davis, Ltd., of Liverpool, has been elected president of the National Federation of Paint, Colour, and Varnish Manufacturers of the United Kingdom. Mr. Davis has represented the North-Western area (which includes Liverpool and Manchester), on the council for the past fourteen years, and is also a member of the National Joint Industrial Council for the industry.

MR. WILLIAM TOYNBEE, owing to failing eyesight, has tendered his resignation as a director and chairman of the Neuchatel Asphalte Co., and the board have elected Mr. William Cash, F.C.A., as a director and chairman in his place. Sir Walter R. Hearn has intimated his intention not to seek re-election as a director at the forthcoming adjourned general meeting, and a proposal to elect Mr. Gilbert Varley in his place will be submitted.

THE JOINT STOCK COMPANY "ZELATYNA" (of Poland), manufacturers of gelatin, has changed its name to "Chemical Establishments at Winnica" (Zaklady Chemiczne w. Winnicy), and has discontinued the manufacture of its principal product. The new company will manufacture organic dyestuffs, and later synthetic inorganic chemicals as well as plastics. It is reported that Etablissement Kuhlmann, of Paris, will hold a large portion of the stock in the new company, and will assure its technical assistance and supervision.

REPRESENTATIVES OF THE ZINC CARTEL, at a meeting in Brussels on Tuesday, decided unanimously to denounce the existing contract as from December 31. It was declared that a production crisis had arisen, and the opinion was expressed that the results of the working of the Cartel were not satisfactory. A committee consisting of a representative each of Belgium, France, Great Britain, Germany, and Silesia was instructed to draw up a new agreement for submission to a meeting of the Cartel to be held in the first fortnight of December.

THE EXHIBITION OF CHEMICAL APPARATUS to be held at Frankfort-on-Main in 1930, an exhibition known shortly as "Achema VI," has assumed an added importance during the past few weeks from the fact that several influential firms have given it their support. A considerable display will be organised by the A. Borsig Co. of Berlin-Tegel and by the United Steel Works of Dortmund. The Lead Industry of Freiberg (Saxony), formerly Jung and Lindig, has decided to demonstrate in a comprehensive exhibition the importance of lead as a basic material in the construction of chemical apparatus. In addition the A.L.G. Dehne Co. of Halle (Saale) will exhibit its special products in the field of filter press construction.

CANADIAN INDUSTRIES, LTD., has come into the fertilisers field with a decision to engage in the manufacture of fertilisers on a large scale at Hamilton, Ontario, and Belœil, Quebec, as well as from the existing factory of the Triangle Chemical Co. in British Columbia. The latter concern is at present stated to be the only company actively concerned in the manufacture of superphosphates in Canada, but according to an announcement just made by Canadian Industries, Ltd., the new factories will turn out superphosphate and fertilising mixtures adapted to soil and crop conditions in the respective provinces, and in this venture will have the technical and commercial backing of Imperial Chemical Industries, Ltd., of Great Britain.

FATAL INDUSTRIAL ACCIDENTS reported during October included six in chemical factories.

THE UNION CHIMIQUE BELGE held a general meeting on October 29. The capital is to be increased from 175 million francs to 192 million francs.

RECENT WILLS INCLUDE :—Mr. William Longton Hicks, M.C., of Hektorstrasse 5, Berlin, Germany, manager for the Cunard Line in Berlin, formerly lecturer in chemistry at Liverpool University (net personalty £1,518), £2,348.

DR. W. H. COATES, having become a director of Imperial Chemical Industries, has resigned his position as treasurer. The board have appointed the secretary, Mr. P. C. Dickens, to be treasurer, and Mr. J. E. James to be secretary.

THE TURIN AGRICULTURAL STATION has been investigating the action of finely-powdered leucite as a fertiliser. The results obtained in combination with suitable nitrogenous fertilisers are said to be better than those given by potassium chloride and sulphate, especially for corn and maize.

A MEMORIAL TABLET to the late Alderman J. C. Clayton was unveiled recently by Alderman J. H. Lloyd, at the University of Birmingham. The tablet testifies to the alderman's services and generosity to the University. The alderman was a chemical manufacturer in Birmingham some years ago.

JOHN WILLIAM BEDFORD, aged 31, of Peacock Street, Middlesbrough, fell a considerable distance to the ground while working on some scaffolding at the Synthetic Works, Billingham, on Monday night. He was admitted to the North Ormesby Hospital with severe internal injuries, and was stated to be in a dangerous condition.

THE DIRECTORS OF WASTE FOOD PRODUCTS, LTD., state, in a circular to shareholders, that, owing to unsatisfactory working of the Stanwell plant, the premises have been closed, and as the company is without cash resources and several actions are pending against the company, the directors have filed a petition for the compulsory winding up.

THE SOCIÉTÉ DES PRODUITS CHIMIQUES DE SAINT-GOBAIN plans to build an important plant for the production of sulphuric acid at La Basse. It will be within easy reach of the canal and of the railway. The building work will require several years, as the establishment of six units of production is contemplated, each measuring 75 metres in length and 30 metres in width.

UNEMPLOYED INSURED PERSONS in the chemical industry in Great Britain at October 21 numbered 6,895 (males 6,178, females 717) ; in the explosives industry, 1,026 (males 742, females 284) ; in the paint, varnish, japan, red and white lead industries, 852 (males 683, females 169) ; and in the oil, grease, glue, soap, ink, match, etc., industries, 4,545 (males 3,691, females 854). The percentages unemployed in the same industries were 6·5, 5·6, 4·5, and 6·1 respectively.

THE LATE DR. CASALE, shortly before his death, was working on a process for obtaining hydrogen by the decomposition of the hydrocarbons in coke oven gas. This process has now been perfected by the engineers of the Società "Siri" (Società Ricerche Industriali), at Dr. Casale's experimental plant at Terni, and within the next few months will be applied industrially by the Terni company in connection with its nitrogen fixation plant at Terni. It is stated that this new Casale process will yield hydrogen more cheaply than any of the existing processes.

MR. JUSTICE MACNAGHTEN gave his deferred judgment in Liverpool Assizes Civil Court on Thursday, November 15, on the claim brought by Mrs. Hilda Billing, a professional and pantomime singer, of 85, The Woodlands, Birkenhead, for damages, against Richards Bros., of Argyle Street, Birkenhead. She alleged that she developed dermatitis through the presence of paraphenylene diamine in the collar padding of a skunk-trimmed coat she bought through them at a Liverpool warehouse in October, 1927. His lordship said he accepted the view that the dye was present in the padding, and that, if Mrs. Billing's skin had come into contact with it, the disease would have been produced. But it was still necessary that she should prove her skin was, in fact, brought into contact with it. He could not infer that it ever did, and he gave judgment for the defendants, with costs. As it might be thought desirable to take the case to a higher court, he added that, had he found Mrs. Billing had made out her case, he would have awarded her £85 damages. Mr. E. G. Hemmerde, K.C., for Mrs. Billing, said he would certainly advise his client to take the case to the Appeal Court.

Obituary

MR. EDMUND CHARLES EXELL, of Sheffield, senior partner in the firm of Exell Bros., manufacturing chemists, of Bank Street and Ellesmere Road, Sheffield.

MR. LEOPOLD JULES WENGER, fourth son of the late Mr. and Mrs. A. F. Wenger, of Newcastle-under-Lyme, at Durban, South Africa. Mr. Wenger was educated at Newcastle High School and on the Continent, and was trained as an analytical chemist at Wiesbaden. For some time he was engaged at the works of Wengers, Ltd., Etruria, but in 1911 he went to South Africa as a farmer. After serving in the war, he returned to South Africa in 1920 as consultant chemist to a number of mining companies.

References to Current Literature

British

ANALYSIS.—The composition of Irish winter butter. P. S. Arup. *Analyst*, November, pp. 634–645.

A new reagent for the colorimetric determination of minute amounts of copper. T. Callan and J. A. R. Henderson. *Analyst*, November, pp. 650–653. The reagent used is sodium diethyldithiocarbonate.

The electrolytic separation of lead and bismuth with controlled potential. E. M. Collin. *Analyst*, November, pp. 654–655.

APPARATUS.—Meniscus corrections involved in the calibration of graduated tubes. A. More. *Analyst*, November, pp. 630–633.

DYE FASTNESS.—The measurement of the colour of textile fabrics and some applications to problems of fading. I.—Introductory. P. W. Cunliffe. II.—The Guild trichromatic colorimeter. P. W. Cunliffe and P. N. Lambert. III.—The spectrophotometer, with a note on the spectral adsorption of dyed woollen fibres. P. W. Cunliffe and P. N. Lambert. IV.—The Lovibond tintometer. P. W. Cunliffe. V.—(a) Comparison of results obtained on the Guild colorimeter, the spectrophotometer, and the Lovibond tintometer. (b) The rate of loss of dyestuffs. P. W. Cunliffe, *Journal Soc. Dyers and Colourists*, November, pp. 305–321. These papers deal with the application of the instruments mentioned to the recording and interpretation of colour and of colour change due to the fading of dyed textile.

GENERAL.—A nomogram for converting observed volumes of gas to normal temperature and pressure. J. H. Coste. *Analyst*, November, pp. 656–657.

United States

CELLULOSE.—The sorption of water vapour by cellulose and its derivatives. S. E. Shepherd and P. T. Newsome. *Journal Physical Chem.*, November, pp. 1817–1834.

A study of the action of light of different wavelengths on nitrocellulose. H. B. Devore, A. H. Pfund, and V. Cofman. *Journal Physical Chem.*, November, pp. 1836–1842.

DYES.—The physical chemistry of colour lake formation. V.—Hydrous oxide-alizarin lakes. H. B. Weiser. *Journal Physical Chem.*, November, pp. 1713–1723.

GENERAL.—Preparation and evaluation of hydrosulphites. A. McGlyn and O. W. Brown. *Journal Physical Chem.*, November, pp. 1665–1681.

The plasticity of clay. L. E. Jenks. *Journal Physical Chem.*, November, pp. 1733–1757.

Studies in absorption. I.—Very soluble gases. W. V. Hanks and W. H. McAdams. *Ind. Eng. Chem.*, November, pp. 1034–1039.

Chemistry of gum formation by cracked gasoline. L. G. Story, R. W. Provine, and H. T. Bennett. *Ind. Eng. Chem.*, November, pp. 1079–1084. A detailed study has been made of gum formation by cracked gasoline. The dish test is described and the factors influencing the test discussed. The changes taking place in cracked gasoline during evaporation and the composition of the gum deposited are given. The absorption of oxygen and formation of gum when gasolines are exposed to sunlight has been investigated. A theory of gum formation is offered, involving primarily autoxidation.

Composition of paraffin wax. S. W. Ferris, H. C. Cowles, Jr., and L. M. Henderson. *Ind. Eng. Chem.*, November, pp. 1090–1092.

PHASE RULE.—The system: Sodium iodate-sodium nitrate-water. H. W. Foote and J. E. Vance. *Amer. Journal of Science*, November, pp. 375–382.

German

ANALYSIS.—The blue colouration of "basic lanthanum acetate" with iodine: A very sensitive test for the acetate-ion. D. Krüger and E. Tschirch. *Berichte*, November 6, pp. 2776–2783.

A rapid gravimetric method for the determination of cadmium as oxalate. J. Dick. *Zeitschrift analytische Chem.*, Vol. 78, Parts 11–12, pp. 414–417.

The determination of sand in rice feeding meals. *Chemiker-Zeitung*, November 16, p. 891.

The colorimetric determination of cobalt. W. Heinz. *Zeitschrift analytische Chem.*, Vol. 78, Parts 11–12, pp. 427–439.

The determination of cobalt by titration of potassium cobaltinitrite. A. W. Wassilieff. *Zeitschrift analytische Chem.*, Vol. 78, Parts 11–12, pp. 439–442.

The colorimetric determination of the turpentine content of air. P. Andrejew and A. Gavrilow. *Chemiker-Zeitung*, November 9, pp. 870–871; November 16, pp. 889–891.

ANALYSIS, GAS.—Quantitative methods of analysis for high-percentage gases. The determination of hydrogen, oxygen, nitrogen and the rare gases in hydrogen. M. Trautz, E. Leonhardt, and K. Kipphan. *Zeitschrift analytische Chem.*, Vol. 78, Parts 11–12, pp. 401–410.

APPARATUS.—A dropping bottle for reagents. P. Fuchs. *Zeitschrift analytische Chem.*, Vol. 78, Parts 11–12, pp. 411–414.

DYESTUFFS.—Chrome dyestuffs ("Chromierfarbstoffe"): Chromotype 2. R. E. Rosenhauer, W. Wirth, and R. Königer. *Berichte*, November 6, pp. 2717–2724.

GENERAL.—The standardisation of scientific chemical literature. M. Pflücke. *Zeitschrift angewandte Chem.*, November 9, pp. 1053–1055.

Odour and constitution. I.—J. von Braun and H. Kröper. *Berichte*, November 6, pp. 2880–2885.

The extraction of bones by means of solvent vapours. E. Schlenker. *Chemiker-Zeitung*, October 30, pp. 838–839.

HYDROGENATION.—Osmium as a hydrogenation catalyst. N. D. Zelinsky and M. B. Turowa-Pollak. *Berichte*, November 6, pp. 2865–2869. Osmium is a very active reduction catalyst, reduction taking place at much lower temperatures than with platinum and palladium.

The formation of aromatic hydrocarbons by catalytic dehydrogenation. N. D. Zelinsky and I. N. Titz. *Berichte*, November 6, pp. 2869–2873.

LEATHER.—The new accelerated leather tanning process. *Chemiker-Zeitung*, November 13, pp. 877–878.

ORGANIC.—4-Methylindole in coal tar. O. Kruber. *Berichte*, November 6, pp. 2877–2880.

Symmetrical triphenylbenzene: A contribution to the knowledge of amorphous resins and lacs. D. Vörlander, E. Fischer and H. Wille. *Berichte*, November 6, pp. 2836–2844.

PLANT.—Economic-chemical plant information. A. Sulfrian. *Chemische Fabrik*, November 13, pp. 487–488.

Advances in sieving technique. A. Kuhr. *Chemische Fabrik*, November 13, pp. 488–489.

Automatic tube-filling and -closing machines. J. Liepold. *Chemische Fabrik*, November 13, pp. 489–490.

Miscellaneous

ANALYSIS.—A new volumetric method of determination of potassium and sodium in the presence of one another. Application to a potassium fertiliser. E. Saz. *Annales Chimie Analytiques*. October 15, pp. 289–301 (in French).

FATS.—The composition of industrial stearins and oleins. V. Vesely. *Chimie et Industrie*, October, pp. 121–128T (in French).

GENERAL.—The present position in the industrial electrolysis of alkaline chloride. P. Bunet. *Chimie et Industrie*, October, pp.99–115T (in French). The manufacture of chlorine, chlorates, hypochlorites and perchlorates.

Investigations on the ignition temperature of solid fuels. W. Swietoslawski, B. Roga and M. Chorazy. *Chimie et Industrie*, October, pp. 116–120T (in French).

The effect of cations of the alkali metals on the precipitation of zinc ferricyanide. F. Cuta. *Collection of Czecho-Slovak Chemical Communications*, October, pp. 538–550 (in French).

ORGANIC.—The direct oxidation of hydrocarbons by air. Dumanois and Mondain-Monval. *Comptes Rendus*, November 4, pp. 761–763 (in French).

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

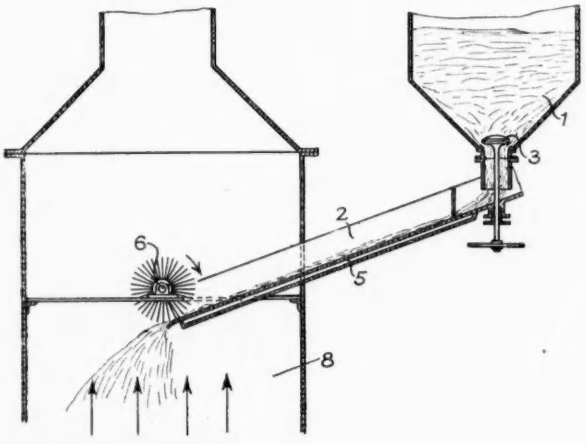
Abstracts of Complete Specifications

319,341, 320,286–7. Catalytic Cracking of Petroleum Oils, Tars, etc., Compagnie Internationale pour la Fabrication des Essences et Pétroles, 1, Avenue de Villars, Paris. International Convention dates, September 21, October 2, and October 24, 1928.

When oil obtained from natural petroleum or from distillation of coal, lignite, shale, etc., is cracked in the presence of a catalyst, the activity of the latter decreases and the constitution of the products varies. In this invention, the oil is vaporised and the vapour cracked and passed to a dephlegmator where the light products are removed. The residual liquids pass to a second vaporiser—catalyser—dephlegmator group, followed in series by other similar groups. The catalysts act for increasing periods on materials more and more reduced, but more and more difficult to crack. Two series of such groups may be employed, one of which is in use while the other is being regenerated. Each vaporiser—catalyser—dephlegmator group may be provided with a purifier following the catalyser, containing divided oxides such as nickel on a porcelain carrier, for the purpose of desulphurising the oils. The purifier is maintained at a temperature sufficient to avoid any condensation. The outlet pipe for light products from each dephlegmator may be connected to a refining apparatus consisting of a heater, one or more purifying chambers for removing sulphur, and one or more catalytic reaction chambers containing nickel. The vapour then passes to a condenser and a receiver, while the non-condensible products pass to an absorber.

319,893. Obtaining Granular Solids. A. J. Collier and F. Heywood, Norton Hall, The Green, Norton-on-Tees, Durham, and Imperial Chemical Industries, Ltd., Millbank, London, S.W.1. Application date, August 27, 1928.

The apparatus is for obtaining granular solids by the cooling of liquids such as solutions of calcium nitrate or mixtures of concentrated ammonium nitrate and calcium carbonate. The molten material is fed from a hopper 1, controlled by hand-operated valve 3, to an inclined trough 2 having a steam jacket 5. A rotary brush 6 is arranged at the lower end of the trough so that a succession of drops is projected into the tower 8, and then cooled and solidified by an ascending current of cold air. As an example, a solution of 45 parts of ammonium nitrate in 5 parts of water may be mixed in the hopper



319,893

with 55 parts of finely divided calcium carbonate and granulated in this manner. The size of the granules depends on the shape and thickness of the flexible rods forming the rotating brush.

320,030. Polyazo Dyestuffs, Process for the Manufacture of. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, May 1, 1928.

Polyazo dyestuffs are obtained by diazotising an amino monoazo or amino disazo compound which is obtained from any desired diazo or diazo azo compound and an amino-ether or amino-thioether of the benzene or naphthalene series which couples in the para position to the amino group. This is coupled with an N-aminobenzoyl-aminobenzoyl-aminobenzoyl-peri-aminonaphthol or an N-amino-benzoyl-aminobenzoyl-peri-aminonaphthol, then diazotised again and finally combined with a suitable pyrazolone or an acetoacetic arylide, methyl ketol or a homologue or substitution product, a sulphazone, 1 : 3-dihydroxy-quinoline, salicylic acid or a derivative. In the N-aminobenzoyl-aminobenzoyl-aminobenzoyl-periamino-naphthol or N-aminobenzoyl-aminobenzoyl-peri-aminonaphthol one or more of the CO.NH linkages can be replaced by the -NH.CO.NH- group and these compounds may contain substituents in the benzene or naphthalene nucleus. Several examples of the structural formulæ of these compounds are given, together with their methods of preparation. Amino ethers of the benzene series applicable as intermediate components include 3-amino-4-methoxy-1-methyl-benzene or the corresponding ethoxy or hydroxyethoxy compound or the sulphuric acid ester or the (4^1-methyl-2^1-aminophenoxy) *b*-propionic acid. Similar compounds of the naphthalene series may be used. The final diazotisation and coupling may be effected on the fibre, using as coupling component a compound containing a reactive methylene group, but no sulphonic acid group, *e.g.*, 3-methyl-1-phenyl-5-pyrazolone or acetoacetic acid ortho-anisidide.

International Specifications not yet Accepted

318,488 and 318,491. Synthetic Drugs. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, September 3, 1928.

318,488. 1-Phenyl-2-methyl-benzylamino-propanol-1 is obtained by reducing methyl-benzylamino-propiophenone or by interaction of phenyl-propanol-methylamine with benzyl chloride and is then treated with *d*-tartaric acid in aqueous or alcoholic solution to resolve it into its optically active components. The *d*-tartrate of the *l*-base crystallizes out, leaving the *d*-tartrate of the *d*-base in solution from which the *d*-base can be precipitated by adding alkali. The *d*-base can be catalytically hydrogenated to obtain *l*-1-phenyl-2-methyl-aminopropanol-1, which is identical with natural ephedrine. The *l*-base is obtained from the crystalline product and is hydrogenated into *d*-1-phenyl-2-methylamino-propanol-1.

318,491. Synthetic drugs containing arsenic and antimony compounds are obtained by introducing an hydroxy-acyl residue into an aromatic amino-substituted arsenic or antimony compound; or introducing an arsinic acid or stibinic acid residue into an hydroxy-acylamino compound of the benzene series, the product being converted if desired into an arsenoxide or stibinoxide or into a symmetrical or unsymmetrical arseno- or stibino-benzene or an arseno-stibino-benzene; or acylating an aromatic arsenic or antimony compound containing an amino group. In one example, *p*-nitraniline is heated with glycollic acid, the nitro group of the resulting *p*-glycollyl-aminonitrobenzene is treated with hydrogen under pressure in the presence of nickel to reduce to the amino group, and the amino group is transformed either into the arsinic acid or stibinic acid group by diazotisation and treatment with arsenious acid or antimony trioxide, yielding *p*-glycollyl-amino-arsinic or stibinic acid.

318,550. Organic Oxygen Compounds. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany.

Oxygenated compounds are obtained by subjecting in the liquid phase to the action of oxygen or gases containing oxygen at 80°—90° C. in the presence of an oxidation catalyst, benzene hydrocarbons having a closed side chain attached to the benzene nucleus, *e.g.*, benzene polymethylene compounds such

as tetra-hydronaphthalene and substitution products, preferably those having a free α-position in the alicyclic nucleus. Suitable oxidation catalysts include oxides or hydroxides of heavy metals, *e.g.*, copper, iron, and nickel, or the metals themselves, in a finely divided state. Tetrahydronaphthalene yields α-keto-tetrahydronaphthalene and α-hydroxy-tetrahydronaphthalene, and ar-ethyl-tetrahydronaphthalene yields a ketone probably ar-ethyl-α-keto-tetrahydronaphthalene and the corresponding secondary alcohol. Some other examples are given.

318,556. SYNTHETIC DRUGS. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, September 5, 1928.

Arsenobenzene derivatives containing a strongly acid group in the nucleus are converted into their alkaline earth salts. The calcium salt of 3-ω-sulphomethylamino-3¹-amino-4 : 4¹-dihydroxy-arsenobenzene, and the calcium and strontium salts of 3 : 3¹-ω : ω¹-disulpho-methylamino-4:4¹-dihydroxy-arsenobenzene are described.

318,595. DYES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, September 6, 1928.

A 6-halogen-2:3-diketo-dihydro-3-keto-2-anil is condensed with 4-methyl-3-hydroxy-thionaphthene, which may have a halogen atom in the 6-position, to obtain vat dyestuffs giving pink to red shades on cotton. These dyestuffs are also obtained by condensing a 4-methyl-2:3-diketo-dihydro-3-keto-thionaphthene-2-anil, which may have a halogen atom in the 6-position, with a 6-halogen-3-hydroxythionaphthene. Examples are given.

Specifications Accepted with Date of Application

294,233. Metallic alloys. Barber Asphalt Co. July 21, 1927.

295,033. Catalytic hydrogenation of aromatic bases, Process for. I.G. Farbenindustrie Akt.-Ges. August 6, 1927.

295,935. Distilling oils by means of a metal bath, Method of. S. Seelig. August 20, 1927.

295,990. Condensation products of naphthalene and naphthalene derivatives, Process for the manufacture of. I.G. Farbenindustrie Akt.-Ges. August 22, 1927. Addition to 265,601 and 273,665.

296,700. Conversion of hydrocarbons of high boiling point into valuable products, especially those of low boiling point. I.G. Farbenindustrie Akt.-Ges. September 5, 1927.

299,720. Acetone, Manufacture of. Consortium für Elektro-Chemische Industrie Ges. October 29, 1927.

301,845. Meth-amino-benzoyl derivative of dimethyl-amino-pentanol, Manufacture of. Soc. des Usines Chimiques Rhone-Poulenc. December 6, 1927.

303,026. Developing dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. December 24, 1927.

307,868. Continuous extraction of acetic acid from its aqueous solutions, Process and apparatus for. Soc. Anon. des Distilleries des Deux-Sevres. March 15, 1928.

321,155. Dyestuffs of the polymethine series, Manufacture of. O. Y. Imray. (*Soc. of Chemical Industry in Basle*). June 27, 1928.

321,161. Highly-halogenated derivatives of pyranthrone, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) July 30, 1928.

321,177. Nitrogenous condensation products from acetylene and ammonia, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) July 27, 1928.

321,190. Water-soluble condensation products, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) June 28, 1928.

321,192. Indanthrone bodies, Production of. R. J. Loveluck, J. Thomas, and Scottish Dyes, Ltd., April 30, 1928.

321,205. Fusing or calcining rock materials for the production of cements, limes, or like substances, Method of and apparatus for. W. Fawcett. July 31, 1928.

321,213. Copper from ores and the like, Recovery of. H. Lavers and B. Taplin. August 2, 1928.

321,239. Emulsifying-agents, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) August 7, 1928.

321,241. Acetaldehyde and acetic acid, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) August, 9, 1928.

321,250. Calcium hypochlorite, Manufacture of. L. Mellersh-Jackson. (*Mathieson Alkali Works.*) August 18, 1928.

321,252. Washing gas, Method of and apparatus for. R. Norgate. August 20, 1928.

321,253. Hydrogenation of crotonaldehyde, Method and apparatus for. G. F. Horsley and Imperial Chemical Industries, Ltd. August 22, 1928.

321,260. Dispersions containing copper, Manufacture of. A. Wacker Ges. für Elektro-Chemische Industrie Ges., F. Kaufler and F. X. Schwaebel. August 28, 1928.

321,336. Finely divided metals, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) November 19, 1928.

Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

Bangham, P. F., Beckett, E. G., Scottish Dyes, Ltd., and Thomas, J. Production of anthraquinone derivatives. 34,563. November 12.

—— Production of derivatives of phthalic acid, etc. 34,985. November 15.

British Celanese, Ltd., Ellis, P. H., Kirk, E. W., and Olpin, H. C. Manufacture of anthraquinone compounds. 34,949. November 15.

British Drug Houses, Ltd., and Carr, F. H. Substances possessing antirachitic properties. 34,873. November 14.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of azine derivatives. 34,404. November 11.

—— Disinfection and destruction of insect pests. 34,546. November 12.

—— Manufacture of vulcanised fibre. 34,715. November 13.

—— Manufacture of 1 : 4 : 4¹-trihydroxy-2 : 2¹-dianthraquinyl-3 : 1¹-oxide. 34,716. November 13.

—— Manufacture of cellulose esters. 34,717. November 13.

—— Manufacture of 1 : 4 : 1¹ : 4¹-tetrahydroxy-2 : 2¹-dianthraquinonyl. 34,718. November 13.

—— Dyeing textile materials containing acetate silk. 34,852. November 14.

—— Dyeing animal fibres. 34,853. November 14.

—— Manufacture of soluble ethers and acyl-products from vegetable materials. 34,854. November 14.

—— Manufacture of substituted naphthalene sulphonic-dicarboxylic acids. 35,016. November 15.

—— Manufacture of derivatives of 3-nitro-4-hydroxy-benzamide. 35,017. November 15.

Geigy Akt.-Ges., J. R. Manufacture of disazo dyestuffs. 34,977. November 15. (Germany, November 15, 1928.)

Groves, W. W., and I.G. Farbenindustrie Akt.-Ges. Manufacture of nitro-meta-cresol-alkyl ethers. 34,535. November 12.

—— Manufacture of ortho-aniline sulphonic acids. 34,663. November 13.

Gutehoffnungshütte Oberhausen Akt.-Ges. Production of formaldehyde from methane. 34,992. November 15. (Germany, November 15, 1928.)

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Apparatus for low-temperature carbonisation. 34,366. November 11.

—— Production of derivatives from alkylene oxides. 34,367. November 11.

—— Process for increasing dissolution of substances. 34,368. November 11.

—— Carrying out reactions with hydrogen under pressure. 34,809. November 14.

—— Production of nitrogenous condensation products. 34,965. November 15.

—— Production of derivatives of high-molecular pyridino compounds. 34,966. November 15.

I.G. Farbenindustrie Akt.-Ges. Production of anthraquinone-acridone containing halogen. 34,365. November 11. (Germany, January 25.)

—— Drying-apparatus. 34,377. November 11.

—— Preparing colour motion pictures. 34,382. November 11. (Germany, November 12, 1928.)

—— Production of endless hanks of artificial fibre. 34,666. November 13. (Germany, November 16, 1928.)

—— Manufacture of basic bismuth salt of organic arsonic acids. 34,845. November 14. (Germany, November 22, 1928.)

—— Dissolving and reprecipitating silk fibroin. 34,846. November 14. (Germany, November 14, 1928.)

—— Manufacture of basic bismuth salts of organic mercury compounds. 34,975. November 15. (Germany, December 3, 1928.)

—— Manufacture of azo dyestuffs insoluble in water. 35,020. November 15. (Germany, November 16, 1928.)

Imperial Chemical Industries, Ltd. Pyrolysis of hydrocarbons. 34,500. November 12.

—— Carrying out exothermic gas reactions. 34,501. November 12.

—— Apparatus for carrying out reactions. 34,828. November 14.

—— Apparatus for transmission of power. 34,923. November 15.

Johnson, T. Electrodeposition of metals. 34,313. November 11.

Kaufman, H. Preparing silicyl compounds. 35,028. November 15. (Germany, November 16, 1928.)

Soc. of Chemical Industry in Basle. Making solutions of infusible amine aldehyde condensation products. 34,381. November 11. (Switzerland, November 10, 1928.)

—— Manufacture of soluble fusible resins. 34,537. November 12. (Switzerland, November 12, 1928.)

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £20 per ton; powder, £21 per ton; extra fine powder, £23 per ton. Packed in 2 cwt. bags carriage paid any station in Great Britain.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength and locality.

ACID NITRIC, 80° TW.—£21 10s. to £27 per ton, makers' works according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 3d. to 1s. 8d. per gall. pyridinised industrial, 1s. 5d. to 1s. 10d. per gall.; mineralised 2s. 4d. to 2s. 8d. per gall.; 64 O.P., 1d. extra in all cases.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4⅜d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex-wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3⅜d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—7d. to 10d. per lb. Crude 60's, 2s. 4½d. to 2s. 6d. per gall.

ACID CRESYLIC 99/100.—2s. 2d. to 2s. 7d. per gall. Pure, 5s. 6d. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Pale, 95%, 1s. 9d. to 1s. 10d. per gall. 98%, 2s. 2d. to 2s. 5d. Dark, 1s. 6d. to 2s. 2d. Refined, 2s. 7d. to 2s. 10d. per gall.

ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.

ANTHRACENE OIL, STRAINED, 1080/1090.—4¾d. to 5¼d. per gall. 1100, 5¼d. to 6d. per gall.; 1110, 6d. to 6½d. per gall. Unstrained (Prices only nominal).

BENZOLE.—Prices at works: Crude, 10d. to 11d. per gall.; Standard Motor, 1s. 5d. to 1s. 6d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall; Pure, 1s. 10d. to 1s. 11d. per gall.

TOLUOLE.—90%, 1s. 9d. to 2s. 1d. per gall. Firm. Pure, 1s. 11d. to 2s. 4d. per gall.

XYLOL.—1s. 5d. to 1s. 10d. per gall. Pure, 1s. 8d. to 2s. 1d. per gall.

CREOSOTE.—Cresylic, 20/24%, 6¾d. to 7d. per gall.; Heavy, 6¼d to 6⅝d. per gall. Middle oil, 4½d. to 5d. per gall. Standard specification, 3d. to 4d. per gall. Light gravity, 2d. to 2¼d. per gall. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8¼d. to 8¾d. per gall. Solvent, 90/160, 1s. 3d. to 1s. 3½d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 5d. per gall. Solvent 90/190, 1s. to 1s. 3d. per gall.

NAPHTHALENE, CRUDE.—Drained Creosote Salts, £4 10s. to £5 per ton. Whizzed, £5 per ton. Hot pressed, £8 10s. per ton.

NAPHTHALENE.—Crystals, £12 5s. per ton. Purified Crystals, £14 10s. per ton. Quiet. Flaked, £14 to £15 per ton, according to districts.

PITCH.—Medium soft, 47s. 6d. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 3s. 9d. to 4s. per gall. 90/160, 3s. 6d. to 3s. 9d. per gall. 90/180, 1s. 9d. to 2s. 3d. per gall. Heavy, prices only nominal.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 8½d. per lb.

ACID GAMMA.—4s. 6d. per lb.

ACID H.—3s. per lb.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—8½d. per lb.

ANILINE OIL.—8d. per lb. naked at works.

ANILINE SALTS.—8d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—£3 1s. 10d. per cwt., in 1 ton lots.

m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots d/d.

p-CRESOL 32/34° C.—2s. per lb., in ton lots d/d.

DICHLORANILINE.—1s. 10d. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITROBENZENE.—8d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 7½d. per lb. naked at works. 66/68° C, 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—10d. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb.

B-NAPHTHYLAMINE.—3s. per lb.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb.

R. SALT.—2s. 2d. per lb.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb.

p-TOLUIDINE.—1s. 9d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.

N. W. ACID.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 15s. to £10 5s. per ton. Grey, £16 10s. to £17 10s. per ton. Liquor, 9d. per gall.

ACETONE.—£78 per ton.

CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10½d. per gall. 16° Tw.

WOOD CRESOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 8d. to 3s. 11d. per gall. Solvent, 4s. to 4s. 3d. per gall.

WOOD TAR.—£3 10s. to £4 10s. per ton.

BROWN SUGAR OF LEAD.—£38 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 3d. per lb. according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 10d. to 2s. per lb.

BARYTES.—£5 10s. to £7 per ton, according to quality.

CADMIUM SULPHIDE.—5s. to 6s. per lb.

CARBON BISULPHIDE.—£25 to £27 10s. per ton, according to quantity

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—4⅝d. to 5¼d. per lb.

LAMP BLACK.—£30 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£20 to £22 per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London

SULPHUR.—£10 to £13 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra

SULPHUR PRECIP. B. P.—£55 to £60 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb., carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. 6d. to 6s. 9d. per lb.

ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£37 per ton ex wharf London, barrels free.

ACID, ACETYL SALICYLIC.—2s. 9d. to 2s. 11d. per lb., according to quantity.

ACID, BENZOIC, B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.

ACID, BORIC B.P.—Crystal, £32 per ton; powder, £36 per ton; extra fine powder, £38 per ton. Packed in 2-cwt. bags carriage paid any station in Great Britain.

ACID, CAMPHORIC.—19s. to 21s. per lb.

ACID, CITRIC.—2s. to 2s. 0½d. per lb., less 5%.

ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.

ACID, MOLYBDIC.—5s. 3d. per lb. in ¼ cwt. lots. Packages extra. Special prices for quantities and contracts.

ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.

ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 7d. per lb. Technical.—1s. to 1s. 2d. per lb.

ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.

ACID, TARTARIC.—1s. 4¾d. per lb., less 5%.

ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.

AMIDOL.—7s. 6d. to 9s. per lb., d/d.

AMIDOPYRIN.—7s. 9d. to 8s. per lb.

AMMONIUM BENZOATE.—3s. 3d. to 3s. 9d. per lb., according to quantity. 18s. per lb. ex Gum.

AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.

AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ¼ cwt. lots. Packages extra. Special prices for quantities and contracts.

ATROPHINE SULPHATE.—9s. per oz.

BARBITONE —5s. 9d. to 6s. per lb.

BENZONAPHTHOL.—3s. to 3s. 3d. per lb. spot.

BISMUTH CARBONATE.—8s. 9d. per lb.

BISMUTH CITRATE.—8s. 3d. per lb.

BISMUTH SALICYLATE.—8s. 3d. per lb.

BISMUTH SUBNITRATE.—7s. 6d. per lb.

BISMUTH NITRATE.—Cryst. 5s. 3d. per lb.

BISMUTH OXIDE.—11s. 3d. per lb.

BISMUTH SUBCHLORIDE.—10s. 3d. per lb.

BISMUTH SUBGALLATE.—7s. 3d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.

BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W Qts. 11d. per lb.

BORAX B.P.—Crystal, £20 per ton; powder, £21 per ton. Packed in 1- or 2-cwt. bags carriage paid any station in Great Britain.

BROMIDES.—Ammonium, 1s. 11½d. per lb.; potassium, 1s. 8¼d. per lb.; granular, 1s. 7¾d. per lb.; sodium, 1s. 10½d. per lb. Prices for 1 cwt. lots.

CALCIUM LACTATE.—B.P., 1s. 2d. to 1s. 3d per lb., in 1-cwt. lots.

CAMPHOR.—Refined flowers, 3s. 3d. to 3s. 4d. per lb., according to quantity; also special contract prices.

CHLORAL HYDRATE.—3s. 1d. to 3s. 4d. per lb.

CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.

CREOSOTE CARBONATE.—6s. per lb.

ETHERS.—S.G. ·730—11d. to 1s. per lb., according to quantity other gravities at proportionate prices.

FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.

GUAIACOL CARBONATE.—4s. 6d. to 4s. 9d. per lb.

HEXAMINE.—2s. 3d. to 2s. 6d. per lb.

HOMATROPINE HYDROBROMIDE.—30s. per oz.

HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.

HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.

HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.

HYPOPHOSPHITES.—Calcium, 2s. 5d. per lb.; potassium, 2s. 8½d. per lb.; sodium, 2s. 7½d. per lb., in 1 cwt. lots, assorted.

IRON AMMONIUM CITRATE.—B.P., 2s. 8d. to 2s. 11d. per lb. Green, 3s. 1d. to 3s. 4d. per lb. U.S.P., 2s. 9d. to 3s. per lb.

IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.

IRON QUININE CITRATE.—B.P., 8¾d. to 9¼d. per oz., according to quantity.

MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.

MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.

MENTHOL.—A.B.R. recrystallised B.P., 18s. 6d. per lb. net; Synthetic, 9s. 6d. to 11s. per lb.; Synthetic detached crystals 9s. 6d. to 14s. per lb., according to quantity; Liquid (95%), 9s. per lb.

MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.

METHYL SALICYLATE.—1s. 6d. to 1s. 8d. per lb.

METHYL SULPHONAL.—18s. 6d. to 20s. per lb.

METOL.—9s. to 11s. 6d. per lb. British make.

PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.

PARALDEHYDE.—1s. 4d. per lb.

PHENACETIN.—3s. 2½d. to 3s. 9d. per lb.

PHENAZONE.—5s. 11d. to 6s. 1½d. per lb.

PHENOLPHTHALEIN.—5s. 11d. to 6s. 1½d. per lb.

POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—105s. per cwt., less 2½ per cent.

POTASSIUM CITRATE.—B.P.C., 2s. 7d. per lb. in 1 cwt. lots.

POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.

POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.

POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included f.o.r. London.

POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.

QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.

RESORCIN.—2s. 10d. to 3s. per lb., spot.

SACCHARIN.—43s. 6d. per lb.

SALOL.—2s. 3d. to 2s. 6d. per lb.

SODIUM BENZOATE, B.P.—1s. 8d. to 1s. 11d. per lb.

SODIUM CITRATE, B.P.C., 1911.—2s. 4d. per lb., B.P.C. 1923—2s. 7d. per lb. Prices for 1 cwt. lots. U.S.P., 2s. 6d. to 2s. 9d. per lb., according to quantity.

SODIUM FERROCYANIDE.—4d. per lb., carriage paid.

SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.

SODIUM NITROPRUSSIDE.—16s. per lb.

SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—100s. per cwt. Crystals, 5s. per cwt. extra.

SODIUM SALICYLATE.—Powder, 2s. 2d. to 2s. 4d. per lb. Crystal, 2s. 3d. to 2s. 5d. per lb.

SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 1d. per lb.

SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £29 10s. per ton, according to quantity. Delivered U.K.

SULPHONAL.—9s. 6d. to 10s. per lb.

TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.

THYMOL.—Puriss., 9s. 1d. to 9s. 4d. per lb., according to quantity. Firmer. Natural, 12s. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.

AUBEPINE (EX ANETHOL).—12s. per lb.

AMYL ACETATE.—2s. 6d. per lb.

AMYL BUTYRATE.—5s. per lb.

AMYL CINNAMIC ALDEHYDE.—15s. per lb.

AMYL SALICYLATE.—2s. 9d. per lb.

ANETHOL (M.P. 21/22° C.).—6s. per lb.

BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.

BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. per lb.

BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.

BENZYL BENZOATE.—2s. 3d. per lb.

CINNAMIC ALDEHYDE NATURAL.—13s. 3d. per lb.

COUMARIN.—8s. 9d. per lb.

CITRONELLOL.—9s. per lb.

CITRAL.—8s. per lb.

ETHYL CINNAMATE.—6s. 6d. per lb.

ETHYL PHTHALATE.—2s. 9d. per lb.

EUGENOL.—11s. 3d. per lb.

GERANIOL (PALMAROSA).—19s. per lb.

GERANIOL.—7s. 6d. to 10s. per lb.

HELIOTROPINE.—6s. 9d. per lb.

ISO EUGENOL.—12s. 6d. per lb.

LINALOL.—Ex Bois de Rose, 12s. per lb. Ex Shui Oil, 10s. per lb.

LINALYL ACETATE.—Ex Bois de Rose, 15s. per lb. Ex Shui Oil, 12s. per lb.

PHENYL ETHYL ACETATE.—11s. per lb.

PHENYL ETHYL ALCOHOL.—9s. 6d. per lb.

RHODINOL.—48s. per lb.

SAFROL.—2s. 3d. per lb.

TERPINEOL.—1s. 6d. per lb.

VANILLIN, EX CLOVE OIL.—14s. to 15s. per lb. Ex Guaiacol, 12s. 9d. to 14s. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. per lb.

ANISE OIL.—3s. 10d. per lb.

BERGAMOT OIL.—14s. 9d. per lb.

BOURBON GERANIUM OIL.—18s. 6d. per lb.

CANANGA OIL, JAVA.—11s. 6d. per lb.

CASSIA OIL, 80/85%.—5s. 6d. per lb.

CINNAMON OIL LEAF.—8s. 6d. per oz.

CITRONELLA OIL.—Java, 3s. 6d. per lb., c.i.f. U.K. port.

CLOVE OIL (90/92%).—8s. per lb.

EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%.—1s. 10d. per lb.

LAVENDER OIL.—Mont Blanc, 38/40%, 13s. 9d. per lb.

LEMON OIL.—12s. 3d. per lb.

LEMONGRASS OIL.—4s. per lb.

ORANGE OIL, SWEET.—13s. 6d. per lb.

PEPPERMINT OIL.—English, 87s. 6d. per lb.; Wayne County, 15s. 6d. per lb.; Japanese, 5s. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

LONDON, *November* 21, 1929.

THE markets have during the past week displayed a fair amount of activity, there being a considerable volume of inquiry in regard to next year's contracts. Prices continue in the main steady and firm, there being an increase in the price of sodium sulphide, all grades, for 1930 delivery, but otherwise there is nothing of outstanding importance to record. Export business is up to average.

General Chemicals

ACETONE.—Rather more inquiry is being received, and a fair amount of business is being regularly placed at £76 10s. to £85 per ton, according to quantity.

ACETIC ACID continues in steady and consistent request at £36 10s. per ton for 80% technical, with the usual £1 per ton extra for 80% edible.

ACID CITRIC is slow of sale, with price a shade easier at about 2s. 1½d. per lb., less 5%.

ACID LACTIC.—There is a steady business at the unchanged price of £43 per ton for the 50% by weight.

ACID OXALIC.—An active demand is coming to hand, with the product firm at £30 7s. 6d. to £32 per ton, according to quantity.

ACID TARTARIC.—Demand is inclined to be slow, with the price unchanged at 1s. 4½d. to 1s. 5d. per lb., less 5%

ALUMINA SULPHATE.—There is a brisk demand for forward delivery and prices are somewhat higher at £8 to £8 5s. per ton for 17/18% iron-free quality.

ARSENIC.—A little more inquiry has been received, and the price is unchanged at £16 17s. 6d. per ton, free on rails mines.

BORAX.—Quite a steady business is passing, price remaining firm at £13 per ton.

CREAM OF TARTAR.—A little more interest is being shown in this product, and the market is inclined to harden; present prices quoted firm at £104 to £106 per ton for 99/100% B.P. qualities.

COPPER SULPHATE.—Demand is increasing, with the market firm at £28 per ton, less 5%.

FORMALDEHYDE.—Substantial business is being conducted, with the price steady at about £36 per ton.

LEAD ACETATE.—Steady conditions continue in this market, with white quoted at £44 per ton and brown at £43 per ton.

LEAD NITRATE.—Rather slow of sale at £33 15s. per ton.

LIME ACETATE.—Steady and in fair demand.

LITHOPONE.—There is more active inquiry for forward delivery, with the prices unchanged at £19 15s. to £23 per ton, according to quality.

METHYL ACETONE.—A steady trade is passing at £57 10s. per ton.

POTASSIUM CARBONATE.—Good business is being placed at £27 per ton for 96/98% best quality.

CHLORATE OF POTASH continues active at £30 per ton.

PERMANGANATE OF POTASH.—The increased demand is maintained, with the market firm at 5½d. to 5¾d. per lb. for B.P. quality.

PRUSSIATE OF POTASH.—There is a steady demand at the firm rates of £63 10s. to £65 10s. per ton.

SODIUM ACETATE is firm and in good demand at £22 to £22 10s. per ton.

SODIUM BICHROMATE.—Unchanged at the firm rate of 3⅜d., with rebates for contracts and in satisfactory requests.

SODIUM HYPOSULPHITE.—Prices for new contracts are unchanged at £14 10s. to £15 per ton for photographic quality, with commercial quality in better request at £8 10s. to £9 per ton.

SODIUM NITRITE.—Unchanged at £20 per ton.

SODIUM PHOSPHATE.—Demand is improving, with dibasic at £12 per ton and tribasic £17 10s., with the markets firm.

SODIUM PRUSSIATE.—A steady trade is passing at the firm rates of 4¾d. to 5¼d. per lb.

SODIUM SULPHIDE.—Prices for new contracts have been advanced by £1 per ton for all grades, and there is a steady business.

TARTAR EMETIC.—There is slightly more business passing, with the price now steady at 11d. per lb.

ZINC SULPHATE.—In good request at £13 10s. per ton.

Coal Tar Products

There is no change to report in the prices of coal tar products from last week. The market remains quiet, with very little business passing.

MOTOR BENZOL remains firm, at about 1s. 5½d. to 1s. 6d. per gallon f.o.r.

SOLVENT NAPHTHA is unchanged, at about 1s. 2½d. to 1s. 3d. per gallon f.o.r.

HEAVY NAPHTHA is quoted at about 1s. 1d. per gallon f.o.r.

CREOSOTE OIL remains at about 3½d. to 4d. per gallon on rails in the north, and at 4¾d. per gallon in London.

NAPHTHALENES remain at about £4 10s. per ton for the firelighter quality, at £5 per ton for the 74/76 quality, and at £6 to £6 5s. per ton for the 76/78 quality.

PITCH.—The price remains at 47s. 6d. per ton f.o.b. East Coast port, with little inquiry.

Nitrogen Products

Sulphate of Ammonia.—The demand for sulphate of ammonia continues quiet, and in view of the large supplies available the price has receded to £8 13s. 9d. per ton, f.o.b. U.K. port, in single bags, for neutral quality, basis 20·6% nitrogen.

Home.—Small sales continue to be made at £9 14s. per ton for November delivery and £9 17s. per ton for December delivery. British producers have not yet announced their prices for January onwards.

Nitrate of Soda.—Up to the present producers continue adhering to their prices, but in view of the increased production and the large accumulation of stocks it is hardly to be expected that this scale can be continued until the end of the season.

South Wales By-Products

SOUTH WALES by-product activities remain moderate. Pitch is in slightly better demand, with values unchanged at 49s. to 50s. per ton delivered. Road tar is unchanged at 11s. to 14s. per 40-gallon barrel, the demand being moderate. Solvent and heavy naphthas are dull, solvent being quoted 1s. 3d. to 1s. 6d. per gallon, and heavy from 11d. to 1s. 1d. Creosote is inactive round about 3d. to 4¼d. per gallon, while motor benzol remains unchanged at 1s. 3½d. to 1s. 5½d. per gallon. Sulphate of ammonia, quoted for home delivery at £9 14s. per ton, has no demand. Refined tars have a steady, but moderate, call with values unchanged. Coke and patent fuel exports continue to expand and the exports at present are the most satisfactory for this year. Patent fuel quotations are :—Ex-ship Cardiff, 22s. to 22s. 6d.; ex-ship Swansea and Newport, 20s. 6d. to 21s. per ton. Coke quotations are unchanged in Cardiff, Newport, and Swansea. Oil imports for the four weeks ending November12 amounted to 7,226,195 gallons.

Latest Oil Prices

LONDON, November 20.—LINSEED OIL was again easier. Spot, ex mill, £44 10s.; November, £41; December, £40 15s.; January-April, £38 15s.; and May-August, £36 15s. naked. RAPE OIL was inactive. Crude-extracted, £42 10s.; technical refined, £44, naked, ex wharf. COTTON OIL was quiet. Egyptian, crude, £31; refined common edible, £36; and deodorised, £38, naked, ex mill. TURPENTINE was steady at 6d. per cwt. decline.

HULL.—LINSEED OIL.—Spot and November, £42 15s.; November-December, £42 10s.; January-April, £40 15s.; May-August, £38 per ton, naked. COTTON OIL.—Egyptian crude, spot, £29 15s.; November-December, £28; edible refined, spot, £33 5s.; technical, spot, £33; deodorised, spot, £35 5s. per ton. PALM KERNEL OIL.—Crude, naked, 5½ per cent., spot, £32 10s. per ton. GROUNDNUT OIL.—Crushed extracted, spot, £35 10s.; deodorised, spot, £39 10s. per ton.

Scottish Coal Tar Products

THERE is no change to report this week. Very few orders have been passing, and prices remain unaltered. Cresylic acids are scarce in this area, but high boiling acid is accumulating at some of the works.

Cresylic Acid.—There is little or nothing offering in Scotland at the moment. Prices remain firm as follows: Pale, 97/99%, 1s. 11½d. to 2s. 0½d.; dark, 97/99%, 1s. 9½d. to 1s. 10½d.; pale, 99/100%, 2s. 2d. to 2s. 4d.; high boiling, 2s. to 2s. 2d.; all per gallon, rails works, naked.

Carbolic Sixties.—Price nominal at 2s. 6d. to 2s. 8d. per gallon.

Creosote Oil.—There is no change to report. B.E.S.A. specification, 4¾d. to 5d.; gas works ordinary, 3½d. to 3⅝d.; washed oil, 3¼d. to 3⅜d.; all per gallon, rails works, in owners' tank wagons.

Coal Tar Pitch.—Stocks are low and business is quiet. Coke oven and horizontal, 47s. 6d. per ton; vertical, 45s. per ton, both f.a.s. Glasgow. Nominal.

Blast Furnace Pitch.—Unchanged at 30s. per ton, rails works, for home, and 35s. per ton, f.a.s. Glasgow, for export, plus usual packing charges if required.

Refined Coal Tar.—A firm market with makers optimistic. 3¾d. to 4d. per gallon, ex works, in buyers' packages.

Blast Furnace Tar.—Very slow. Fixed price remains at 2¾d. per gallon, rails works.

Crude Naphtha.—Nominal at 5d. to 6d. per gallon.

Water White Products.—Rather quiet. 90/160 solvent naphtha, 1s. 2d. to 1s. 2½d.; heavy solvent, 90/190, 1s. 0½d. to 1s. 1d.; benzol, 1s. 5½d. to 1s. 6d.; all per gallon, ex works, in bulk.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

GLASGOW, *November 20, 1929*

BUSINESS in the chemical market remained during the past week much on a par with previous levels, the demand for export being especially good. Prices generally remain firm, and any variations are within small limits. There are no outstanding changes to report, with the exception, perhaps, of formaldehyde, where the demand has been particularly good, but keen Continental competition has rather tended towards lower prices.

Industrial Chemicals

ACETONE, B.G.S.—£76 10s. to £85 per ton, ex wharf, according to quantity. Inquiry remains satisfactory.

ACID ACETIC.—This material is still scarce for immediate supply, but prices remain unchanged as follows: 98/100% glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80% pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton. Powder, £32 per ton, packed in bags, carriage paid U.K. stations. There are a few fairly cheap offers made from the Continent.

ACID CARBOLIC, ICE CRYSTALS.—Prompt delivery difficult to obtain and prices now quoted for early delivery round about 8d. per lb., delivered or f.o.b. U.K. ports.

ACID CITRIC, B.P. CRYSTALS.—Quoted 2s. 2d. per lb., less 5%, ex store, prompt delivery. Rather cheaper offers for early delivery from the Continent.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy; dearsenicated quality, 5s. 6d. per carboy, ex works full wagon loads.

ACID NITRIC, 80° QUALITY.—£24 10s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—On offer at about 3¼d. per lb., ex store. Offered from the Continent at 3¼d. per lb., ex wharf.

ACID SULPHURIC.—£2 15s. per ton ex works for 144° quality; £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC, B.P. CRYSTALS.—Quoted 1s. 5d. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 1s. 4½d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted at round about £7 10s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 7s. 6d. per ton, c.i.f. U.K. ports. Crystal meal about 2s. 6d. per ton less.

AMMONIA, ANHYDROUS.—Quoted 7½d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton, powdered £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Spot material quoted £37 per ton, ex wharf. On offer for prompt shipment from China at £34 per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Now quoted £18 per ton, ex wharf, prompt despatch from mines. Spot material still on offer at £19 15s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £11 per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 12s. 6d. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price £4 5s. per ton to £4 15s. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works, or £4 12s. 6d. per ton f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Remains steady at about £36 10s. per ton, ex works.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 5s. per ton, ex wharf.

LEAD, RED.—Price now £37 10s. per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £37 10s. per ton, c.i.f. U.K. ports.

LEAD ACETATE.—White crystals quoted round about £39 to £40 per ton, ex wharf. Brown on offer at about £2 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 O.P. quoted 1s. 4d per gallon, less 2½%, delivered.

POTASSIUM BICHROMATE.—Quoted 4⅜d. per lb. delivered U.K. or c.i.f. Irish ports, with an allowance of 2½% for minimum 2½ tons to be taken.

POTASSIUM CARBONATE.—Spot material on offer at £26 10s. per ton ex store. Offered from the Continent at £25 5s. per ton c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99⅜/100% POWDER.—Quoted £25 10s. per ton ex wharf. Crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb., ex store. Offered for prompt delivery from the Continent at about 6¾d. per lb. ex wharf.

SODA, CAUSTIC.—Powdered 98/99% £17 10s. per ton in drums, £18 15s. per ton in casks. Solid 76/77% £14 10s. per ton in drums, and £14 12s. 6d. per ton for 70/75% in drums, all carriage paid buyers' stations, minimum 4-ton lots, for contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3⅞d. per lb. delivered buyers' premises with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or Pea quality 27s. 6d. per ton extra. Light soda ash £7 1s. 3d. per ton ex quay, minimum 4-ton lots with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots. Prices for this year unchanged.

SODIUM NITRATE.—Chilean producers are now offering at £9 9s. per ton, carriage paid buyers' sidings, minimum 6-ton lots, but demand in the meantime is small.

SODIUM PRUSSIATE.—Quoted 5¼d. per lb., ex store. On offer at 5d. per lb., ex wharf to come forward.

SODIUM SULPHATE (SALTCAKE).—Prices 50s. per ton, ex works, 52s. 6d. per ton, delivered for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption. Solid 60/62% £9 per ton. Broken 60/63% £10 per ton. Crystals 30/32% £7 2s. 6d. per ton delivered buyers' works on contract, minimum 4-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £10 7s. 6d. per ton; ground American, £9 5s. per ton; ex store.

ZINC CHLORIDE, 98%.—British material now offered at round about £20 per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £10 per ton, ex wharf.

NOTE.—Please note that the above prices are for bulk business and are not to be taken as applicable to small parcels.

Netherlands Consumption of Nitrogenous Fertilisers

THE consumption in the Netherlands of nitrogenous fertilisers in the year ended June 30, 1929, amounting to 357,200 metric tons, with a pure nitrogen content of 81,532 tons, was nearly 89 per cent. higher than in the year 1924–25. The following table shows the consumption during the years ended June 30, 1925 and 1929:—

	Nitrogenous Fertilisers.	
	1925. Metric Tons.	1929. Metric Tons.
Sodium Nitrate	129,000	132,000
Ammonium Sulphate	67,000	130,000
Nitrate of Lime	3,000	67,000
Ammonium Sulphate Nitrate	—	15,000
Cyanamide	—	9,000
Urea	—	4,200
Total	199,000	357,200

Consumption of pure nitrogen in a period of four years increased 138 per cent.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, November 21, 1929.

There is no more than a moderate volume of inquiry about for chemicals on the market here, and buying interest during the past week has been on generally quiet lines, with, however, fair specifications against contracts still being reported in respect of a number of the principal products. Current prices keep up very well in most sections so far as prompt business is concerned, whilst with regard to forward transactions the general feeling on this market during the past week is that firmness, and, in certain lines, higher contract prices for next year, may be expected.

Heavy Chemicals

The demand for chlorate of soda this week has been rather quiet, with offers at from 2½d. to 2¾d. per lb., according to quantity. Caustic soda is attracting a fair amount of attention still, and fair contract deliveries are being taken, the latter being quoted at from £12 15s. to £14 per ton, according to quality. Bichromate of soda meets with a moderate inquiry, with prices maintained on the basis of 3⅝d. per lb., less discounts for quantities. A quietly steady business is going through in the case of alkali at round £6 per ton, and similarly in bicarbonate of soda at £10 10s. per ton, both in contracts. Saltcake keeps steady at about £3 per ton, although the demand this week has not been particularly active. Phosphate of soda is obtainable at round £11 per ton for the dibasic quality, a quiet trade being reported. Sulphide of sodium is well held at £8 per ton for the commercial quality and up to £9 10s. for the 60–65 per cent. concentrated solid material, buying interest being on a moderate scale. Prussiate of soda meets with a quietly steady demand and prices are firm in this section at from 4¾d. to 5¼d. per lb., according to quantity. There is not much business passing at the moment in the case of hyposulphite of soda, with the commercial grade quoted at round £8 per ton and the photographic material at £15 5s.

Permanganate of potash keeps reasonably steady, although the demand this week has been on quiet lines; the pharmaceutical grade is quoted at 5¼d. per lb. and the commercial at from 5⅛d. to 5¼d. Yellow prussiate of potash keeps very firm at from 6¾d. to 7¼d. per lb., according to quantity, and a moderately active business is reported. Bichromate of potash also is attracting a fair amount of buying interest, with offers on the basis of 4⅝d. per lb., subject to discounts on contracts. Chlorate of potash meets with a quiet demand at from 2¾d. to 3d. per lb., according to quantity. With regard to carbonate of potash, values are steady at round £25 10s. per ton for the 96–98 per cent. strength, with caustic potash unchanged on the week at from £32 10s. per ton upwards.

Arsenic is steady and is somewhat more active at about £16 per ton at the mines for white powdered, Cornish makes. A quiet business has been reported this week in the case of sulphate of copper, with current values in the neighbourhood of £27 per ton, f.o.b. The acetates of lead are quiet at about £40 per ton for white and £39 for the brown material, nitrate of lead selling in limited quantities at from £33 to £33 10s. per ton. The tendency in the case of the acetates of lime seem to be easy if anything, the grey quality being on offer at round £16 per ton, and the brown at about £7 15s. per ton, with the demand on very moderate lines.

Acids and Tar Products

A fairly steady trade is being done in acetic acid, prices of which are well held at about £36 iper ton for the 80 per cent. commercial product and round £66 for the glacial. Tartaric acid is in quiet demand though unchanged on the week at 1s. 4¼d. per lb. Citric acid seems to be fairly steady at the moment at from 2s. to 2s. 1d. per lb. There is a moderate demand about for oxalic acid on this market and quotations for this keep up at about £1 13s. per cwt., ex store.

By-product prices, on the whole, keep steady. There is a moderate movement in the case of pitch, which is quoted at 47s. 6d. per ton, f.o.b. Creosote oil ranges from about 4d. to 4½d. per gallon, naked, a quiet trade being put through. With regard to carbolic acid, crude is scarce and firm at round 2s. 7d. per gallon, with crystals on offer in odd lots at about 10d. per lb. There is a quiet demand about for solvent naphtha, current offers of which are at round 1s. 2d. per gallon, naked.

Company News

A. B. Fleming and Co.—An interim dividend of 1s. per share is announced.

Eastman Kodak of New Jersey.—The directors have declared payable on January 2, 1930, regular dividend of 1½ per cent. on preferred stock, regular dividend of $1.25 per share on common stock, and an extra dividend of $0.75 per share on common stock.

Bell Brothers (Manchester).—It is announced that the half-yearly dividend due on March 31 last will be paid on participating 7½ per cent. preference shares. A capital reduction scheme has been sanctioned whereby these £1 shares are reduced to 15s. shares entitled to 10 per cent., and the ordinary to 6d. from 1s. The dividend now declared is on the £1 shares.

Weardale Lead Co., Ltd.—A profit for the year ended September 30 last, including income from investments, of £15,530 is shown in the directors' report. Property, plant and machinery is written down by £3,558, and a final dividend of 1s. 6d. per share, making, with the interim already paid, 10 per cent. for the year (the same as a year ago), is proposed, leaving £7,131 to go forward.

New Tamarugal Nitrate Co.—The preliminary figures for the year to July 31, received from the local board in Valparaiso, show a gross profit, after allowing for amortisation and depreciation, of £142,415, compared with £142,643 for 1927–28, the net profit after deduction of general expenses and Chilean income tax being £123,688, against £121,375. A dividend of 5 per cent. was paid last June, and after creating a new account called "Extension and Development Fund" with a transfer of £75,000 from profits, a balance of £119,691 is carried forward. For 1927–28 three dividends totalling 7 per cent. were paid. The report of the board in Chile and the full accounts are expected to be issued about the middle of December.

Mount Lyell Mining and Railway Co.—The results for the year to September 30 show net profits of £324,128, an increase of £124,078. Charges before arriving at the profits include £46,047 for prospecting and development (against £25,236), and £65,576 for depreciation, compared with £36,701. A final dividend of 6½ per cent. and bonus of 7½ per cent. are payable on December 18, making 20 per cent. for the year, against 12½ per cent. Excluding shares in other companies, surplus of liquid assets is £420,608, compared with £641,455 on September 30, 1928, the decline being due mainly to sundry debtors and stocks on hand, formerly pertaining to the chemical works department, being now represented by shares in the Commonwealth Fertilisers and Chemicals. Holdings in other companies stand in the books at a total valuation of £1,382,907.

Lawes' Chemical Manure Co.—A circular accompanying the report for the year ended June 30, 1929, states that since the last annual general meeting considerable progress has been made in the reorganisation of the company on the lines indicated in the circular letter of November 26, 1928, and in the chairman's speech at the last general meeting. It was decided at the earliest convenient date to dismantle the acid works and to place that portion of the works site on the Thames at Barking on the market, together with certain vacant land. The plant was sold on June 27, 1929, and shortly the ground will be cleared. This site of nearly ten acres, and a twelve-acre site on Barking Creek, were put up to auction without a sale resulting at the time. Since then, agents acting for important interests have been negotiating with company's agents for the purchase of this property, and these negotiations are still in progress. With regard to the scheme for reduction of capital and return to the members of cash in excess of the company's needs, the directors consider that in view of the negotiations referred to above, the position is not sufficiently advanced for them to place their proposals before shareholders.

Germany's Sodium Chlorate Exports

Germany's export trade in sodium chlorate for the first half of 1929 was over 40 per cent. more than the corresponding period in the previous year. The United States took nearly one-third of the total exports, amounting to 3,171 metric tons. Great Britain, Russia, and Sweden are the other principal purchasers of this chemical. It is consumed in the United States principally for weed eradication.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks, and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to November 30, 1929.

METROTECT.

506,023. Class 1. Anti-corrosives and anti-incrustation compositions. South Metropolitan Gas Company, 709, Old Kent Road, London, S.E.15; manufacturers. September 12, 1929. To be Associated with No. 35-205 (1881) and others.

MIRAGE.

506,285. Class 1. Lacquer for floors, linoleum, oilcloth and the like. F. Hulse and Co., Ltd., Woodlesford, near Leeds; chemical manufacturers. September 21, 1929.

OPALOGEN.

506,639. Class 1. Chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives. I.G. Farbenindustrie Aktiengesellschaft (a joint stock company organised under the laws of Germany), Mainzerlandstrasse, 28, Frankfort-on-Main, Germany; manufacturers. October 4, 1929.

AZETOPAL.

506,640. Class 1. Chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives. I.G. Farbenindustrie Aktiengesellschaft (as above). October 4, 1929.

ZEPHROL.

506,453. Class 3. Chemical substances prepared for use in medicine and pharmacy. May and Baker, Ltd., Garden Wharf, Church Road, Battersea, London, S.W.11; manufacturing chemists. September 27, 1929.

An I.C.I. Harvest Supper

Jealott's Hill Experimental Farm Staff

THE annual harvest supper for the staffs of Imperial Chemical Industries at Jealott's Hill Experimental Farm, Warfield, was held on Friday, November 1, and was presided over by Sir F. Keeble, F.R.S., director of research. It was the third annual harvest supper, and over 100 men sat down in a rustic barn, surrounded by huge bins of artificial fertilisers. The field workers were the guests of the evening, and young chemists in plus-fours waited on them with food and drink.

With Sir F. Keeble at the head table were Mr. H. J. Page, chief research officer and head of the Jealott's Hill station, Mr. S. E. Buckley, the farm manager, Col. W. H. Peel, chief farm officer of Imperial Chemical Industries, and Messrs. W. Gavin, G. W. Cheveley and Allen, representing the London staff. In addition to the Jealott's Hill employees, workers from Hawthorndale, the adjoining farm recently acquired by the I.C.I., were also present, and Mr. Michael, who farmed the estate, was one of the guests.

Sir F. Keeble read a message from Lord Melchett, who wrote that he would always regard Jealott's Hill as of the utmost importance to Great Britain and the whole Empire, and he trusted that at some subsequent harvest supper he would be privileged to attend in person and express his warm appreciation of the way they were forwarding the great work to which they had set themselves.

Sir F. Keeble proposed the toast of Jealott's Hill farm, which was responded to by Mr. H. J. Page for the indoor staff and Mr. S. E. Buckley for the outdoor staff.

Shale Oil in Australia

FOR some time past attempts in Australia to establish the extraction of shale oil on a commercial basis have been confined to Tasmania. It is now reported that a retort, capable of extracting 2,500 gallons of oil a day, will shortly commence operations at Baerami, extracting shale oil and residuals from the ore, which is plentiful in the district. The retort, which is an Australian invention known as the A.B.S., has been given a thorough trial at St. Leonard's, Sydney. A company has taken up further leases adjoining those already held.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

SANDS, C., AND CO., Ariel Works, Duncan Street, Salford, chemical merchants. (C.C., 23/11/29.) £18 4s. 6d. October16.

Mortgages and Charges

[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case, the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]

DARWEN COLOUR AND CHEMICAL CO., LTD.—(M., 23/11/29.) Registered November 7, £1,500 debenture, to H. C. Lees, Arkendale, Sudell Road, Darwen, physician and surgeon; charged on Springfield Mill, Spring Vale, Darwen, also general charge.

LANDORE OXIDES, LTD., Swansea. (M., 23/11/29.) Registered November 7, debenture to Bank; general charge. *Nil. December 31, 1928.

NITRATE PROCESSES, LTD., London, E.C. (M., 23/11/29.) Registered November 7, £5,000 debentures; general charge. *Nil. January 11, 1929.

Satisfaction

BRITISH CELANESE, LTD. (late BRITISH CELLULOSE AND CHEMICAL MANUFACTURING CO., LTD.), London, W. (M.S., 23/11/29.) Satisfaction registered November 13, £44,479, part of amounts registered August 24, 1922, and July 6, 1923.

London Gazette, &c.

Partnerships Dissolved

CLYDESDALE METALLIC COMPANY (Charles Malcolm CLEARE and Ernest Charles RAYMENT), metallic paint manufacturers, at 80, Union Street, Borough, London, by mutual consent as and from November 2nd, 1929. Debts received and paid by C. M. Cleare.

WILLIAMSON AND ALLEN (Charles ALLEN and James WILLIAMSON, tallow merchants and soap manufacturers, Westgate Street, Gloucester, by mutual consent as from September 30, 1929. Debts received and paid by J. Williamson.

New Companies Registered

ALLIED SILICA AND CHEMICAL PRODUCTS, LTD., 9, York Place, Edinburgh.—Registered November 18 in Edinburgh. Nominal capital, £2,500 in 4,000 preference shares of 10s. and 2,000 ordinary shares of 5s. each. To acquire any lands, mines, mining, oil, water, timber and silica rights or silica products, or any other mineral or other by-products, etc. Directors: G. E. Baker, A. Vincent.

SUPERFINE CHEMICALS, LTD., 22, Buckingham Gate, London.—Registered November 13th. Nominal capital, £5,000 in £1 shares. Chemical and general engineers, manufacturers of chemicals and other products, etc. Directors: Major O. Sumner, A Holland and H. Dering.

SWIFT AND WRIGHT, LTD., 16, Upper St. Martin's Lane, London, W.C.2.—Registered November 15. Nominal capital, £2,000 in £1 shares. Varnish, japan and colour manufacturers and merchants, importers and manufacturers of and dealers in chemicals, industrial and other preparations, anti-friction greases, anti-fouling compositions, oils, paints, paint removers, pigments, etc. Directors: T. H. Wright, O. P. Swift.